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ABSTRACT

Peruvian education achieved notable successes in the late 20th century, with primary education reaching almost all children and secondary institutions enrolling about 80 percent of 12- to 16-year-olds. Public expenditure on education increased steadily in the 1990s but was still significantly less than the Latin American average. This report examines Peruvian data from 1990 to 1997 on enrollments; expenditures; system performance indicators (access, grade repetition, completion rates, labor market outcomes, learning outcomes); teacher qualifications and salaries; and teaching conditions. It concludes that Peru's high participation rates with low expenditures were made possible by relatively equitable public expenditures focused on basic education; the ability to contain salary costs; and households' high level of educational spending. However, expanding access under extreme resource constraints has come at the expense of quality. There are large gaps in school survival rates between rich and poor, between rural and urban, and between indigenous and nonindigenous populations; large between-school variance in student achievement; and rising returns to higher levels of education. These findings indicate that policy changes could make a difference, particularly to disadvantaged students. Recommendations include improving equity by targeting disadvantaged groups, particularly rural and indigenous children; enhancing quality of schools, teachers, and instruction; and improving efficiency of resource use. Background notes describe the structure of education, methodology and statistical analyses, and the system of teacher education and professional development. Appendices present extensive data tables. (Contains 117 references.) (SV)

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A WORLD BANK COUNTRY STUDY

Peruvian Education at a Crossroads

Challenges and Opportunities for the 21st Century

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A WORLD BANK COUNTRY STUDY

Peruvian Education at a Crossroads

Challenges and Opportunities for the 21st Century

The World Bank
Washington, D.C.

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PREFACE

The Government of Peru (GOP) has made poverty alleviation one of the cornerstones of its policy. Even so, in 1997 about 49 percent of Peru's population of 25 million people still lived in poverty, and 15 percent in extreme poverty. The World Bank's assistance program for Peru emphasizes support for the GOP's poverty reduction policies and investments. In order to guide its own work in helping the GOP deal with persistent poverty, to deepen its dialogue with government, and to inform public discourse, the Bank initiated a coordinated set of studies bearing on poverty reduction. The studies covered four topics: poverty itself, health, indigenous peoples, and education. This report conveys the findings of the education study. It seeks to inform discussion of potential policy options by examining the impact of public and private finance, and policies for resource use, on education and labor market outcomes. As such, it is one contribution to the larger discussion of human resource development and poverty reduction in Peru.

The GOP has viewed investment in education as essential for social cohesion, for personal and moral development, and for improving individual economic productivity and employment prospects. Educational improvements thus underpin strategies both for poverty reduction and for long-term economic and social development. The current situation reflects important accomplishments. Almost all Peruvian children enroll in primary education, and opportunities for secondary and higher education well exceed what would be expected for a country of Peru's income level.

Despite achievements to date, the new government inherits major problems that have received insufficient attention. Significant gaps remain—between the rich and the poor, between rural and urban areas, and between indigenous and nonindigenous populations—in school completion rates and learning outcomes. Overall challenges also remain for upgrading quality at all levels and for extending coverage of early childhood, secondary, and higher education. One path into the 21st century would pursue steady incremental improvements of the current situation. Another path for policy would seek a marked improvement in the intellectual and technical capacity of the population through a focussed commitment to closing gaps and meeting remaining challenges. The new government has thus arrived at a crossroads in education policy.

This report reviews the period from 1990 to 1997. The study has limited its scope to analyzing data made available in or before 1997, but has not been able to take advantage of data that have been made public since the events in late 2000 and early 2001. While not incorporating newly released data, we have concluded after an intial review of this material that it does not change the general picture outlined herein.

This World Bank document reports the work not only of its own staff but, also, to an unusual extent, that of Peruvian academics, policy analysts, and public officials. The document reflects a collective effort.

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Acronyms and Abbreviations

ADE	Areas de Desarrollo Educativo (Education Development Areas)
AE	Area de Ejecución (Area of Execution)
AFP	Administración de Fondo de Pensiones
APP	Authorized Pensionable Position
CIAS	Comité Interministerial de Asuntos Sociales (Interministerial Committee of Social Affairs)
CORDELICA	Corporación de Desarrollo de Lima y Callao
CTAR	Consejo Transitorio de Administración Regional (Transitional Council of Regional Administration)
DRE	Director Regional de Educación
FONAVI	Fondo Nacional de Vivienda (National Housing Fund)
FONCODES	Fondo Nacional de Compensación y Desarrollo Social (Social Fund)
GRADE	Grupo de Análisis para el Desarrollo
INEI	Instituto Nacional de Estadística e Informática
INFES	Infraestructura Nacional para Educación y Salud (National Infrastructure for Education and Health)
IPSS	Instituto Peruano de Seguro Social (Peruvian Institute of Social Security)
IST	Institutos Superiores Técnicos (Higher Technical Institutes)
ISP	Institutos Superiores Pedagógicos (Higher Institutes of Pedagogy)
MECEP	Proyecto para Mejoramiento de la Calidad de la Educación Primaria
MED	Ministerio de Educación (Ministry of Education)
MEF	Ministerio de Economía y Finanzas (Ministry of Economy and Finance)
MINSA	Ministerio de Salud (Ministry of Health)
OECD	Organization for Economic Cooperation and Development
ONP	Oficina de Normalización Previsional (Pension Office)
PLANMED	Planning Unit in MED
PROMUDEH	Ministerio de Promoción de la Mujer y del Desarrollo Humano (Ministry for the Promotion of Women and Human Development)
PRES	Ministerio de la Presidencia (Ministry of the Presidency)
USE	Unidades de Servicios Educativos (Educational Service Units)
UNESCO	United Nations Educational, Scientific and Cultural Organization

Exchange Rates (1997): Soles 2.66 = US$1
Fiscal Year: January 1 to December 31
School Year: April 1 to December 31 (180 days/year)

Vice President	David de Ferranti
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EXECUTIVE SUMMARY

Peruvian education has achieved notable successes in the second half of the 20th century. Primary education now reaches almost all children. Secondary and tertiary education institutions enroll about 80 percent of the 12- to 16-year olds and 30 percent of the 17- to 25-year olds, respectively. Few countries in Peru's income range achieve comparable coverage. These accomplishments are particularly impressive given Peru's geographical and ethnic diversity.

The government in the 1990s steadily increased public expenditure on education, despite constraints imposed by disciplined fiscal policies. Nonetheless, at 3 percent[1] of Gross Domestic Product (GDP) in 1997, Peru's public spending on education remained significantly less than the Latin American average of 4.5 percent.

That Peru was able to attain high enrollment with a low level of public spending results from several factors: (i) achievement of near universal primary education before qualitative improvement; (ii) containment of the growth of personnel expenditure, channeling the additional public resources to build up infrastructure and capacity; and (iii) mobilization of high levels of household expenditure on education (total household spending on public and private education accounted for about 2 percent of GDP—much higher than the OECD's 1.3 percent). These factors operated in the context of what might be labeled a first generation of reform occurring in the early 1990s. This reform was characterized by rationalization of the public sector, regionalization of administration, deconcentration of social services, encouragement of private education, and extension of free and compulsory education.

Despite these accomplishments, important challenges remain. Disparity between the rich and poor—and between rural and urban areas—remains pronounced in access to preschool, secondary education, and tertiary education, as well as in school completion rates. Disparity is also manifested in levels of achievement between indigenous and nonindigenous populations, and between public and private schools. Meanwhile, the earnings differentials between workers with different levels of education are growing. In urban areas, the largest increase in earnings differentials is between university educated and secondary educated workers. This signals a growing demand for higher skill levels in an open economy that is facing increasing international competition and technological change. These trends have serious implications for the employment prospects and future lifetime earnings of disadvantaged groups.

Peru has thus reached a crossroads for education policy at the beginning of the 21st century. The status quo reflects major accomplishments. One direction for policy would, therefore, involve useful but relatively limited improvements in the current situation. This direction, however, may prove inadequate to fulfill the country's goal of having a highly

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[1] In Peru, pensions are paid out of the recurrent budget of each ministry, not out of a separate pension fund as in many other countries. Pensions accounted for about 21 percent of the total public expenditure on education. Net of pension, public spending on education accounted for only 2.4 percent of the GDP in 1997.

educated citizenry—fully competitive by international standards—to underpin poverty reduction and to facilitate economic and social development. A second generation of reform would be required if this direction were taken. This study explores these issues and lays out options for a second wave of reform.

Either of the broad directions for policy will need to identify specific ways of improving educational quality. This report analyzed the factors affecting fourth graders' mathematics achievement levels in 1996 to identify options to improve quality. The findings are encouraging in indicating potential directions where change could make a difference:

The analysis found that *after controlling for a number of explanatory variables*, the performance of poor and extremely poor departments was better than nonpoor departments. Some departments were doing a better job in educating over-aged students. Aymara students performed as well as Spanish-speaking students. Quechua students could achieve as much as others if they were not studying in predominantly Quechua-speaking schools, thereby indicating the potential for policy to reduce the disparity by increasing support to these schools. Teachers who graduated from universities and from Institutos Superiores Pedagógicos, teachers who have had longer years of service, and teachers who have had more in-service training courses, were positively associated with higher student achievement, relative to those teachers who have not had these qualifications, years of service, and training opportunities. Nonavailability of textbooks was associated with lower achievement. Parental expectations—potentially modifiable through publication of assessment results and learning determinants—helped shape outcomes. Even within the limitations of this first assessment effort, the findings are sufficiently important to warrant attention for the policy possibilities to equalize educational outcomes and improve quality more generally.

Because the burden for financing education is disproportionately heavier for poorer than richer households, public policy cannot rely on general increases in income to bring improved educational quality for disadvantaged populations. Increases in public sector investment will be required to ensure the equality of educational opportunity for all and improved economic opportunity for all—by directing more public resources to the poor. Past constraints on public expenditure allow room for new allocations to meet this mandate without exceeding reasonable overall public allocations to the sector. But increased public commitment to education will prove to be of little value unless the resources are committed not only to the right groups but also to the right interventions.

To level the playing field for all Peruvian children, then, it is necessary to improve equity, quality, and efficiency. All countries face these challenges. In Peru, the policy options to meet them include the following:

- *Improving equity*: Government support can come in the form of proven supply-side interventions. These include extending the current provision of each class with a set of instructional materials and supplies from primary education to preschool and secondary education; expanding provision of bilingual education programs and texts;

stepping up recruitment and strengthening training of indigenous teachers; training rural teachers in multigrade teaching; providing incentives to rural teachers; extending cost-effective health and nutrition programs for school-age children; and expanding access to secondary education (in part by establishing distance learning programs). Also important are demand-side financing measures (such as grants and scholarships targeted to rural areas and indigenous students, particularly girls).

- *Improving quality*: Many of the interventions just listed to improve equity will also enhance quality. Additional options include: changing the system of incentives — such as adjusting the salary scale to reward higher levels of skills and competency and to compensate for the difficult working conditions in the rural areas, opportunity for professional development, and open-ended tenure to be determined by performance. Setting standards for learning and teaching, strengthening teacher pre-service and in-service training, teacher performance evaluation, and rewarding schools for improved performance (perhaps through formula-based funding) are among the options to sustain the efforts to enhance quality. These measures require complementary improvement in the frequency, quality, and transparency of student assessment (with results available to administrators, principals, teachers, parents, students, and the general public); the recently introduced program of national testing provides an excellent start in this direction. Building consensus with all stakeholders on the direction and means for change will be critical to build a culture of accountability.

- *Improving efficiency in planning and policy*: Efficiency objectives can be advanced by (i) strengthening coordination of educational policy and financial matters between the budgetary entities that have responsibility for education (Ministry of Education, the Regions, universities, decentralized institutions, and Ministry of the Presidency, as well as the Ministry of Women and Human Development); (ii) proactive gathering of information on teachers and school-level finance (in both public and private schools) to guide policy; and (iii) using student achievement data systematically to target additional resources for schools falling below certain performance levels, while recognizing schools which have made above average progress over time.

Some measures are easier to implement (such as provision of educational materials) than others (such as setting standards to drive development of teacher professionalism) because the latter involve institutional and cultural change. Therefore the timeframe of implementation will vary.

Many countries have committed far more public resources to education than has Peru, but without achieving universal coverage for basic education. For these countries, increasingly binding fiscal constraints and continued needs to expand coverage of basic education sharply constrain the policy agenda. Peru, in contrast, has positioned itself at a crossroads. One direction to take involves continuation and improvement of the system much as it currently is. On the other hand, Peru has achieved the preconditions to initiate a major drive to consolidate equity gains and expand access while improving quality. Choosing this path would require, over time, substantially increased public expenditures

on education. A gradual increase from 2.4 percent to 4.5 percent of GDP net of pension expenditures (that is, to the Latin American average) is, for Peru, feasible in the medium term, given its past demonstrated ability to maintain fiscal discipline and to improve macroeconomic performance. By increasing public expenditure levels to only the Latin American average, Peru has the opportunity to enhance markedly the intellectual ability and competitiveness of its labor force within a generation. No policy challenge is more significant.

Chapter 1. Sector Overview

As a lower middle-income country with a Gross National Product (GNP) per capita of $2,460 in 1997,[1] Peru has made impressive progress in extending education opportunities over the last five decades. Between 1950 and 1997, enrollment expanded 6.6 times, more than double the three-fold increase of the population.[2] Total enrollment grew from a mere 14 percent of the population in 1950 to 36 percent in 1997. As a consequence, over the period, the average education level of the population of age 15 and over increased from 1.9 years to 8.6 years,[3] and the illiteracy rate was reduced from 58 percent to 11 percent. Female illiteracy was reduced from 70 to 18 percent, and rural illiteracy from over 60 to 29 percent. These are impressive accomplishments in a country as physically and ethnically diverse as Peru, particularly in view of its recent history of macroeconomic instability and civil unrest. Chapter 1 summarizes achievements to date and describes recent developments and issues in the sector.

1.1. Achievements

In 1997, school enrollment was practically universal for the 6- to 11-year olds, about 80 percent of the 12- to 16-year olds, and over 30 percent of the 17- to 25-year olds.[4] The education system now encompasses about 8 million children and adults, of whom 6.7 million are in the public, formal system. (See Background Note 1 for the structure of the education system, Appendices 1 to 3 for education statistics, and Appendix 4 for gross and net enrollment ratios.)

International comparison shows Peruvian enrollment ratio in a remarkably favorable light, as is presented in Figure 1. Each bar in the figure stands for a particular country in the World Bank's education database, and Peru is high up on the list, where the neighbors on the graph are mostly developed nations.

When international comparison is made of the level of public spending on education as a percentage of Gross Domestic Product (GDP), however, the position of Peru changes, as is shown in Figure 2, which is also drawn from the same World Bank database. In the second graph, the neighboring countries include a number of low-income countries.

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[1] See World Bank, 1998b, *World Development Report*, p. 191.

[2] See Díaz, Huayte, Farro, and Távara (1995, p. 22), which cites Instituto Nacional de Estadística e Informática (INEI) and Ministry of Education (MED) statistics.

[3] The average of 1.9 years of education corresponds to the national census of 1940. The 8.6 years of education is based on the National Survey of Living Standards by INEI (Encuesta Nacional de Niveles de Vida, or ENNIV), 1997.

[4] The findings were based on analysis of a household survey conducted by Instituto Cuanto in 1997. The Cuanto dataset was more extensive in its questionnaire about education expenditure than the government's INEI dataset. Therefore, it was used for this study.

Figure 1. International Comparison of Enrollment of Students between the Ages of 3 and 23

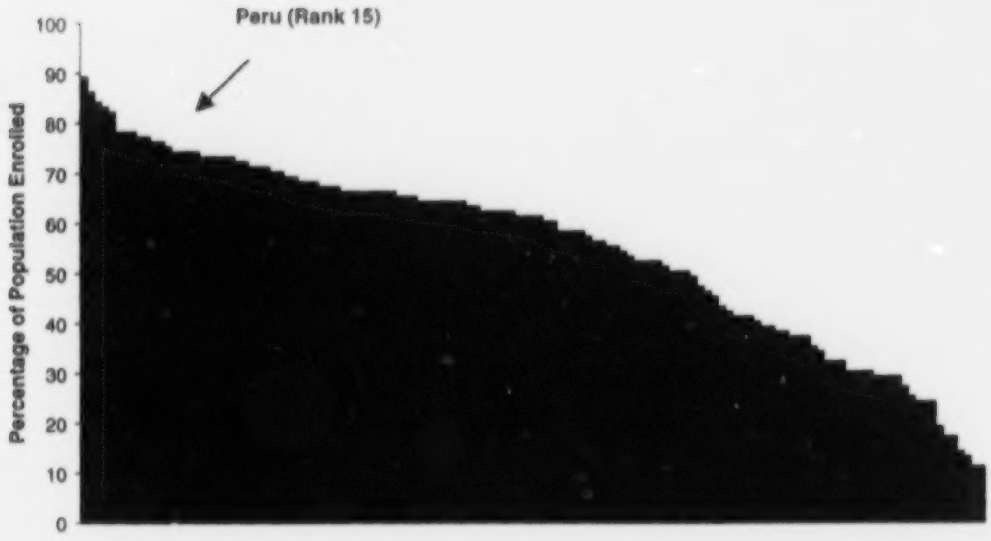

Figure 2. International Comparison of Public Expenditure on Education as a Percentage of Gross Domestic Product

Source: Edstats Database of The World Bank

These figures provide a compressed account of achievements to date and also pose a question: what can explain the puzzle that Peru has been able to achieve an unusually high participation rate with a relatively low level of public spending on education? How has this been accomplished? Answering this question raises the main policy issues that this report addresses. Several hypotheses for explaining the puzzle are investigated and their policy implications are discussed:

(a) Is it because public resources have been well used and well targeted?
(b) Is it because Peruvian households value education highly and spend heavily on education?
(c) Has expansion of access to basic education come at the expense of qualitative improvement?
(d) Is the low level of public spending attributable to the ability to contain the salary cost of teachers? How does this and other policy on teachers affect the profession?

The chapters in the report correspond roughly with the above questions. Chapter 1 sets the context for discussion by summarizing achievements to date and by describing recent developments in the sector. Chapter 2 reviews public expenditure on education in order to address the question of whether public resources have been used efficiently and equitably; it also examines private spending on education to assess the impact on equity. Chapter 3 analyzes indicators on access, school survival rates, quality, and labor market outcomes to evaluate the tradeoff between quantitative expansion and qualitative improvement within the constraints of public and private finance. Chapter 4 reviews the policy towards teacher employment and deployment, conditions of service and compensation, incentives and accountability. Chapter 5 explores the options for improving equity, quality, and efficiency, and discusses the resource implications.

1.2. The Evolving Education System

Many of the policy changes that have taken place in Peru in the 1990s represent, to a considerable extent, a break with the past. The evolution of this policy environment must be viewed against the economic and political crises of the late 1980s. Fiscal deficit (which included debt servicing) was equivalent to 10 percent of GDP in 1988. Hyperinflation cumulated to a rate of over 7,000 percent in 1990. Insurgency was rampant in the countryside and at times in the cities.

The year 1990 marked a turning point. Structural adjustment under the Fujimori Administration restored fiscal discipline. Sound macroeconomic management, in combination with the ending of the Shining Path insurgency in 1994, gradually set the economy on a growth path. By 1997, a balanced budget (which included debt servicing) was achieved; savings in the current account progressively increased to 4.4 percent of GDP; and both GDP growth and inflation were estimated at around 7 percent each. Before the effects of the East Asian financial crisis was spread to Latin America in 1998, Peru's economic growth rate was second only to that of Chile in the region. Although the economy suffered a downturn in subsequent years, its past demonstrated ability to turn the economy around indicates the potential once political and economic stability is restored.

In the first half of the 1990s, along with major reform of macroeconomic policy, a series of measures were implemented to contain public expenditure, to mobilize private resources, and to delegate social services to the regions. These measures and the changes they set into motion are as follows:

- Rationalization of the public sector and introduction of a private personalized pension plan

Retrenchment of government services between 1991 and 1993, which resulted in a reduction in employment in the central administration of the Ministry of Education (MED) by 72 percent.[5] Vacant or new positions in the Ministry are filled by consultants on contract. To contain personnel expenditure, authorized pensionable positions (APP) for the entire sector have been frozen since 1995.

In 1994, a new personalized pension plan (AFP) (Law 25897), modeled after the Chilean private pension plan, was introduced.[6] People on public payroll, including teachers, are given the option of choosing whether they want their pension to be covered by the previous laws, or have the individualized account which they can invest with a private company for capitalization. Since it is a personalized plan, they can take the pension

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[5] World Bank, 1994b: *Peru: Public Expenditure Review*, Report No. 13190-PE, p. 50.

[6] Before the reform, two laws governed the pensions for teachers:

(1) Law 20530, which affects those teachers who joined the service before 1980, has no minimum retirement age. It allows female retirees to receive 7/25 and male retirees to receive 7/30 of their basic salaries after they have contributed 6 percent of their basic salaries for 7 years. Female retirees who have worked for 25 years and male retirees who have worked for 30 years are entitled to 100 percent of their basic salaries. Pension benefits are not only fully adjusted for inflation, but will be linked to the salary increments of current serving employees. When pensioners were still in active service, they also contributed 9 percent of their salaries to social security (Instituto Peruano de Seguro Social or IPSS) and 5 percent to a housing fund (Fondo Nacional de Vivienda or FONAVI), while the employer (that is, MED) contributed 6 percent. Pensioners have to continue to contribute 4 percent of their pension to the Treasury in order to enjoy the benefits.

(2) Law 19990, which affects those teachers who joined the service after 1980, imposes a minimum retirement age of 55 for women who had completed 25 years of service, and 60 for men who had completed 30 years of service. Pension benefits were fixed and not adjusted for inflation. Active teachers have to contribute 13 percent of their basic salaries, 9 percent to IPSS and 5 percent to FONAVI.

There is no doubt that the pension provided under Law 20530 was very generous, and provided coverage to those who might be as young as their late thirties and early forties (which are the age groups of the last cohort of ISP graduates who joined the teaching profession before 1980). In fact, Law 20530 provides a strong incentive for teachers to retire with pension and start a second career, such as teaching in or founding private schools. It was not surprising that the retrenchment of the early 1990s resulted in launching the second career of many enterprising persons in this sector. The incomplete system of data collection left the Government unable to calculate the total number of teachers and their age structure governed under these three retirement laws. This has made it difficult to project the total pension obligations of the education sector. The pension issue has been a dominant one in public expenditure on education. The reform has stopped future drain on public expenditure.

wherever they are employed.[7] Salaries paid to teachers who choose the personalized pension plan are higher than those under previous laws in order to provide incentives for conversion (Appendix 6.19). Meanwhile, the Government has created a Pension Office (Oficina de Normalizacion Previsional, or ONP for short) which will eventually handle all pension matters. The new personalized pension plan is expected to lessen the burden of the state treasury and make employment more flexible by de-linking it with specific employers.

These measures to contain public expenditure, along with other policies, helped restore fiscal balance. These, however, came at the cost of low morale in the public sector, which could ultimately undermine high performance. Cost containment alone could not result in efficiency gain without concomitant use of transparent criteria for personnel recruitment and resource allocating, setting up of incentives to reward performance, and introduction of accountability. Towards the second half of the 1990s, there has been increased attention to these complementary needs.

Competitive examinations were introduced in 1997 to select new principals and teachers to fill vacant authorized pensionable positions (APP). A national student assessment program was set up in 1996 to monitor achievement. These measures, although still in an early stage of implementation, provide the building blocks towards the establishment of a merit-based system. Further policy guidelines on standards for teachers and students, strengthened pre-service and in-service training, and incentives and accountability, backed up by resources to fund them, would counteract the morale issue, professionalize the teaching force, and improve the quality of education.

- **Extension of free and compulsory education in the 1993 Constitution**

The Constitution of 1993 extends compulsory and free education from primary to secondary education. In 1997, a proposed structural change of the education system redefined basic education by extending downward by one-year to include initial education for 5-year-old children, and by shortening secondary education from five to four years. This will make the overall duration of basic education 11 years. The plan is to progressively extend universal initial education to cover children of four years of age, and then, those of three years of age. Since secondary education was shortened, it is compensated by the introduction of two years of preparatory course work (*bachillerato*) which is not compulsory but free and will provide the transition to tertiary education or to the world of work. Certificate examinations will be held at the end of basic education, *bachillerato,* and tertiary education (Table 1).

This structural change has far reaching implications on the resource requirements to implement the policy, the supply and demand for teachers at different levels and in different subject specialties, and the content and methods of teacher in-service and pre-

[7] Employees who choose private pensions have to contribute 11 to 13 percent of their basic salaries to future pension, and 5 percent to FONAVI, while the Government contributes 9 percent to IPSS to cover health insurance.

service training. How various components of the proposal can be synchronized remains to be worked out.

Table 1: A Comparison of the Existing and New Education Structures

Age	Existing Structure	Age	New Structure	Objective of Change
3-5	Nonuniversal initial education	5	1 year of universal initial education at the age of 5	Facilitate the articulation between initial and primary education to improve efficiency of the system
6-11	6 years of universal primary education of uneven quality	6-11	Duration of primary education remains unchanged, but emphasis is on improving the quality	Develop the capacity of learning
12-16	5 years of secondary education that has uneven access between rural and urban areas	12-15	4 years of universal secondary education	Guarantee free access and the use of distance education for rural areas to extend coverage. 1 year of preschool, 6 years of primary, plus 4 years of secondary education will form *11 years of universal basic education.* Certification of study at the end of basic education.
		16-17	2 years of bachillerato is a new introduction. It is not compulsory but free in public schools.	Preparation for work and for tertiary education. Certification of study at the end of bachillerato.
17-	Tertiary education	18 and over	Tertiary education	Remains unchanged.

Source: MED, *Nueva Estructura del Sistema Educativo Peruano: Fundamento de la Propuesta*, 1997.

- **Encouragement of private schools**

Complementary to the need to contain public spending and to the constitutional mandate for expanded compulsory education is a new law that encourages establishment of private schools. This legal framework, combined with retrenchment of education administrators and teachers, has led to a rapid growth of private schools.[8] This supply has met the demand of parents who have grown weary of frequent closing of public schools due to teachers' strikes in the early 1990s, who consider the quality of public education unsatisfactory, and who can afford to pay for private schools. (See Figures 3 and 4 for increase in enrollment in public and private schools.)

[8] There are a number of private schools: secular schools, cooperative schools, Catholic and other religious schools, all of which are privately financed and privately run. In addition, there is *Fe y Alegria*, which is operated by the Catholic Church, but financed by the State.

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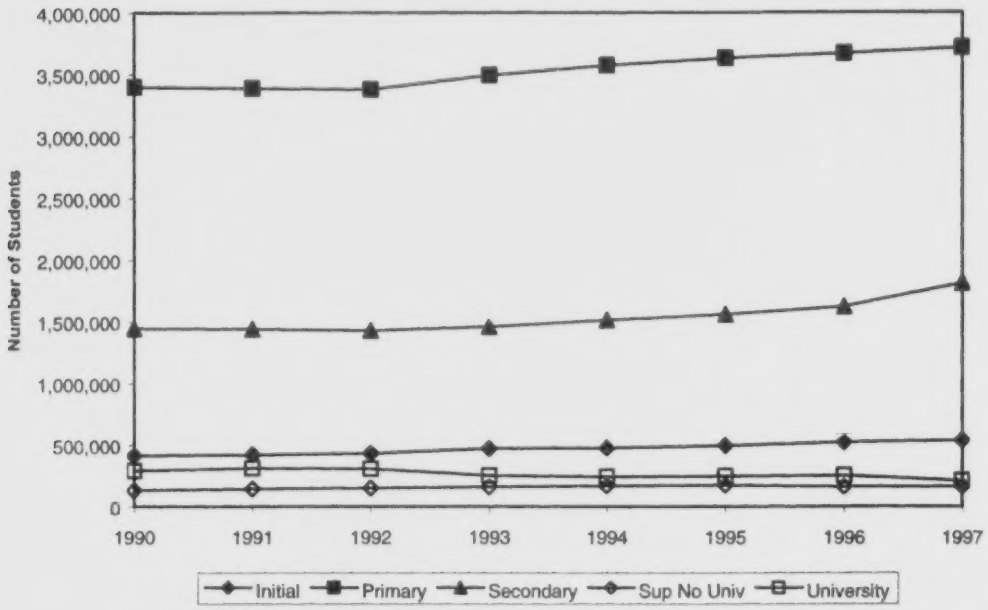
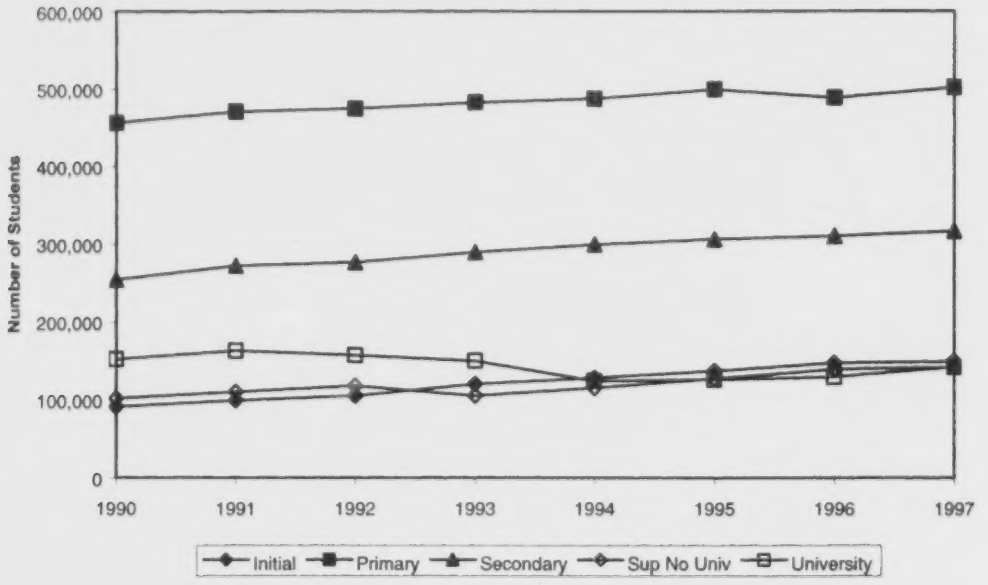
Figure 3. Trend of Enrollment in Public Institutions by Level, 1990 to 1997



Source: Ministry of Education

Figure 4. Trends of Enrollment in Private Institutions by Level, 1990 to 1997



Source: Ministry of Education

Between 1990 and 1997, enrollment in private education grew by 62 percent in initial education, 9 percent in primary education, 28 percent in secondary education, and 37 percent in tertiary nonuniversity education (MED statistics). This outpaced the rate of increase at these levels in the public sector, which grew only by 34 percent in initial education, 8 percent in primary education, 10 percent in secondary education, 25 percent in tertiary nonuniversity education.[9] Within the rapidly expanding tertiary nonuniversity sector, private teacher training institutions accounted for a significant share. (See Appendices 1.1 and 1.3.)

The overwhelming majority of private school students are from the richest consumption quintile of the country. For example, in the urban areas, these students accounted for as much as 39 percent of net enrollment in the 6 to 11 age group, 27 percent of the 12 to18 age group, 21 percent of the 17 to 25 age group (Appendix 4.3d). A significant percentage of the fourth quintile also chose private schools. By contrast, there were less than 1.5 percent of students from the poorest quintile of all age groups in private schools. In the rural areas, overall, there was not even 1 percent of children of all age groups in private schools. In the public school system in urban areas, net enrollment of the richest quintiles in primary education (53 percent) was much lower than that of the poorest quintile (85 percent) (Appendix 4.2d). The implications for policy will be discussed in Chapter 2.

- **Setting up of regional administration, deconcentration of education services, and creation of new ministries**

The 1993 Constitution also restructures the political system. It divides the country into regions, departments, provinces, and districts.[10] At each region, the Transitory Council of Regional Administration (Consejos Transitorios de Administración Regional or CTAR in short) coordinates all regional affairs and finances. In the case of Lima and Callao, the Development Corperation of Lima and Callao (CORDELICA) serves a similar function as the CTAR. The CTARs and CORDELICA are directly under the Ministry of the Presidency (PRES).

PRES was created at the same time. Not only does it coordinate the region's education budget but also has responsibility for most of the capital expenditure on education

[9] The decline in public and private university enrollment in official statistics is inconsistent with reality. The most probable reason is due to nonreporting in the case of private universities. As for public universities, the dramatic decline in enrollment between 1996 and 1997 is most probably because only the registration in the first semester is taken into account. Normally, registration in both semesters would be averaged out for the entire academic year. The figure for 1997 was probably not yet updated. An informal survey by the World Bank found that enrollment in public universities has remained stable in the 1990s, while that in private universities has grown rapidly.

[10] The political levels that have elected offices are the central government and the municipal government (provincial and district municipal governments). The central government has an elected president and congress. The provincial and district municipal governments have their respective elected mayors and councils. The CTAR each appoints a president and a regional coordination council.

through National Infrastructure for Education and Health (Infraestructura Nacional para Educación y Salud, or INFES in short).

While the central government and the municipal governments have their own revenue sources, the regional administrations do not, and depend on the central government for transfer of revenue. Regionalization of administration has affected the budget process, intragovernmental allocation of resources, and the balance of power between various ministries in the center and the regions.

In education, MED retains the overall responsibility for setting education policy on preprimary, primary, secondary, vocational, and tertiary nonuniversity education, but not on university education. Public universities remain autonomous and outside the jurisdiction of the MED or regional administrations. They have their own coordinating body, the National Assembly of Rectors (Asamblea Nacional de Rectores). A new ministry, Ministry for the Promotion of Women and Human Development (Ministerio de Promoción de la Mujer y del Desarollo Humano or PROMUDEH in short), which was created in 1996, is in charge of early childhood care for children from birth to four or five, and the literacy program.

MED is charged with the missions of developing the character of the individual, improving the quality of life, and facilitating social development in Peru through promotion of culture, science and technology, physical education, and pursuit of excellence. The responsibility for provision of educational services from preschool to tertiary nonuniversity education has been delegated to 23 Regional Education Directorates (Direcciones Regionales de Educación or DREs in short) which sit within the regional administration, and to the Directorate of Education in Lima and that of Callao. MED makes educational policy for the entire nation, and gives technical and normative directions to the DREs, which implement policies. The Education Director of Lima is appointed by the Minister of Education, and the other Regional Education Directors are also appointed by the Minister with the approval of the regional administration.

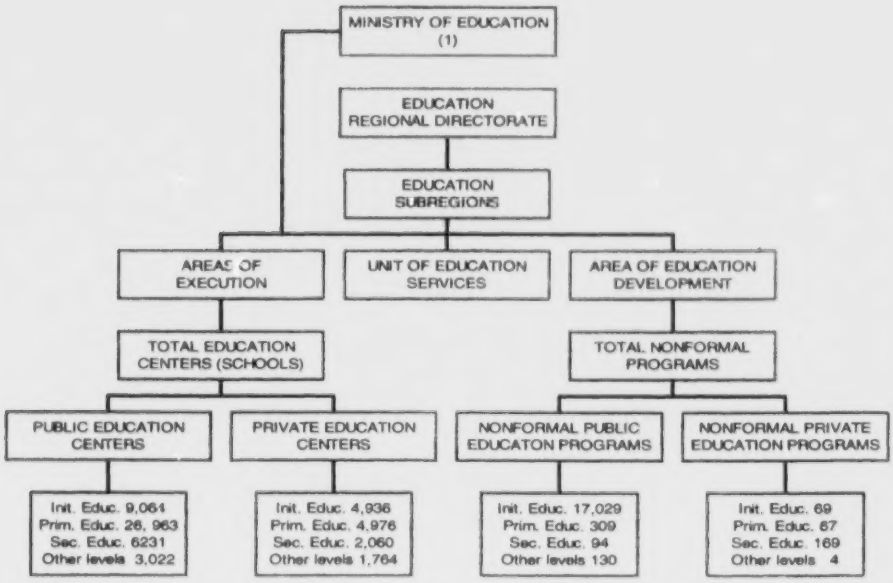
Under the DREs are Areas of Execution (AEs), Educational Service Units (Unidades de Servicios Educativos or USEs for short), and Education Development Areas (Areas de Desarrollo Educativo or ADEs in short).[11] The USEs manage some 58,000 schools and about 18,000 nonformal educational programs, both public and private (Figure 5). Both AEs and USEs are administrative units, but ADEs are educational supervision and support units. USEs are line units executing the functions and budgets of the DREs or Sub-DREs.

Each DRE is headed by a director, who is assisted by two committees: one composed of the heads of subordinate units (Sub-DREs), another composed of the heads of internal line units, such as internal control, administration, legal and technical advisors'

[11] Decree 26011 provides the framework for decentralization of educational administration and management, and transfers the private right to Communal Councils of Education (Consejos Comunales de Educación or COMUNED) for the administration of public schools. But months after the approval of the law, it was decided that it would not be implemented.

office, and technical pedagogic and technical cultural departments. Sub-DREs and USEs are organized essentially along the same lines.

Figure 5:
MINISTRY OF EDUCATION
OPERATIONAL STRUCTURE
05-29-98



Source: Ministry of Education

Summary. Policies implemented since 1990 have irrevocably changed the education system. Containment of public spending and mobilization of private resources may be loosely considered as the first generation of reform. Important achievements ensued. Yet, in the course of implementation, many issues have arisen that must be addressed in order for the sector to move forward. These issues have largely defined the scope for a second wave of reform which must deal with remaining inequities, quality improvement, further expansion, and institutional issues. Table 5 at the end of Chapter 5 provides an overview of how these new measures cross cut with the issues of public and private finance, quality, efficiency and equity, and the teaching profession.

Chapter 2. Education Finance

Two key questions in the puzzle posed at the beginning of the report are whether Peru's ability to finance high level of enrollment is because public resources have been used efficiently and equitably and whether households spending on education is high. This chapter evaluates these questions by first reviewing public spending on education and then by looking at the magnitude and impact of household financing. It then discusses the policy implications.

2.1. The Budget Process

To understand public finance of education in Peru, it is important to first understand the budget process. The fiscal year in Peru coincides with the calendar year as well as the school year. The budget process begins in May every year when the lowest units submit their budget requests for the following year. The Ministry of the Economy and Finance (MEF) consolidates all requests in August and presents to the Congress in September. The Congress approves the budget in November/December for funds to be allocated in January.

There are five budgetary entities in education: (a) MED, which covers the greater Lima/Callao area, (b) regions, (c) public universities, (d) other decentralized institutions, and (e) PRES. The first four are entitled primarily to handle recurrent expenditure under their jurisdiction, while the last one is responsible for investment and, hence, controls most of the capital expenditure through INFES.[12]

Since the establishment of regional administration in 1991, each of these entities prepares their own budget and negotiates directly with MEF.[13] The process begins when schools present their requests for recurrent budget to the USEs, which submit a consolidated request to the DREs which, in turn, forward the aggregated budget to the CTARs. These budgets are consolidated in PRES, and then presented to MEF. MED's budget which also covers greater Lima and Callao and some national programs are submitted directly to MEF. The universities and decentralized institutions submit their own respective budgets directly to MEF. PRES also presents its budget for capital expenditure in education directly to MEF. Coordination is weak between MED and the regions, between MED and PRES, and between the regions and PRES.[14]

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[12] The budget for PROMUDEH, which has responsibility for literacy programs and early childhood care, is not consolidated with education. The budget for these activities is very small. Since PROMUDEH was created only in 1996, this report does not cover this new ministry.

[13] In principle, this practice was to have changed after April 1, 1998, to have MED coordinate all recurrent budgetary matters for the regions. The new process was supposed to enable MED to have an overview of the nation's education budget and spending patterns. However, this was implemented for only three months and then there was a reversion to the old process.

[14] DREs have little control over their own capital investment. For example, since all the education allocation to them covers only recurrent spending, if DREs want to buy a computer for

Under this process, MED does not have complete information about what the regions have requested and the regions do not report to MED about their actual expenditure. Therefore, much of the policy by MED which has national application has been made without clear information on the requirements and availability of resources in the country. MEF has the ultimate say over allocation of education resources but without having an overall view of priorities and strategies in the education sector. There is no coordinating body in education that can assure the coherence of policies and provide the necessary resources to support them.

MEF's decisions for allocating resources are based on the availability of public funds to match with what have been requested by MED and the DREs to deliver services. The first obligation is to pay salaries and pensions, and then to meet the needs for providing basic services of each of the entities. There are no funding formula to allocate resources other than the aforementioned priorities. Funds are allocated on a quarterly basis, but spent on a monthly basis. Funds not used as planned every month have to be returned to MEF at the end of the month, to be deposited back to the public treasury. There is no incentive to award savings.

The main ground for allocating recurrent budgets to each DRE is the number of authorized pensionable positions (APPs) for teachers and administrative staff. These positions, in turn, are based on the ratio of allocating, on average, one teacher for every 35 students in the urban areas, and one teacher for every 20 students in rural areas, with some variations by level and for remote areas. On the surface, this method of allocation has given special consideration to the rural areas. However, the 20 students in the rural areas may be of different ages and grade levels, and the teacher does not have a full range of skills to meet all of their educational needs. Moreover, since the freeze of pensionable positions in 1995, the departments that have high birth rates (usually poorer and with a larger indigenous population) have been more adversely affected than others.

Teachers and administrators in the urban areas are paid monthly through deposit to their bank accounts although some are paid by checks; most of those in rural areas are paid by check. Textbooks, library books, and other educational materials and supplies are generally purchased by MED at the central level and are delivered to DREs, which distribute them to all schools under their jurisdiction. Electricity and water for evening schools are paid by the USEs. For many schools, parents' contribution pay for water and electricity. Many rural schools have neither water nor electricity.

Given the fragmentation of the budgetary process, there is a strong case for improving coordination among various budgetary entities to assist the coherence of educational policy and raise efficiency in resource allocation to the sector as a whole. Equally strong is the case for improving the consistency, flexibility, and transparency of funding decisions through formula that reward efficiency and allow for adjustment to local needs.

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use in the office, they have to submit a separate request to the CTARs for incorporation into the regions' capital budget request.

2.2. Public Expenditure on Education[15]

Historical trend. Government allocation constitutes the most important source of funding for education in Peru. Enrollment growth, however, has far exceeded the growth rates of either the GDP or public expenditure on education. Between 1970 and 1990, GDP increased by 85 percent in real terms, total government expenditure by 84 percent, public expenditure on education by 72 percent, while enrollment in public institutions by 130 percent (Appendix 6.2).

Public spending on education fluctuated widely throughout the 27 years under review. Between 1970 and 1997, public expenditure on education[16] peaked in 1972 at 3.7 percent of GDP, falling to 2.2 percent in 1988 at the lowest point, and recovering to 3 percent in 1997.[17] The steep decline in public spending on education in the late 1980s reflected the extremely volatile macroeconomic environment. In 1988, when GDP contracted by 8.4 percent in real terms and total government expenditure by 29 percent, total public spending on education declined disproportionately by 40 percent (Figures 6 and 7, Appendices 6.1 and 6.2).

The recovery of public spending on education in the 1990s started from this extremely low base in the late 1980s. After declining in real terms by 40 percent in 1988, 10 percent in 1989, and 7 percent in 1990, allocation to education increased annually by some 3.6 percent in 1991 and 1992, respectively, by 18 percent in 1993, by 23 percent in 1994, and by 20 percent in 1995. It was reduced by 7 percent in real terms in 1996 but rose by 18 percent in 1997. The overall trend in the 1990s is a reversal of that in the 1980s: education expenditure has increased at a higher rate than that of GDP or total government expenditure (except for two years) (Figure 7). This trend indicates the government's commitment to education. Consideration for fiscal balance, however, has led to a gradual approach to increasing public spending on education. The enormous fluctuation of public expenditure on education over time, nonetheless, reflected deep-seated instability and unpredictability in resource allocation, which made it difficult for strategic planning, and undermined continuity of projects.

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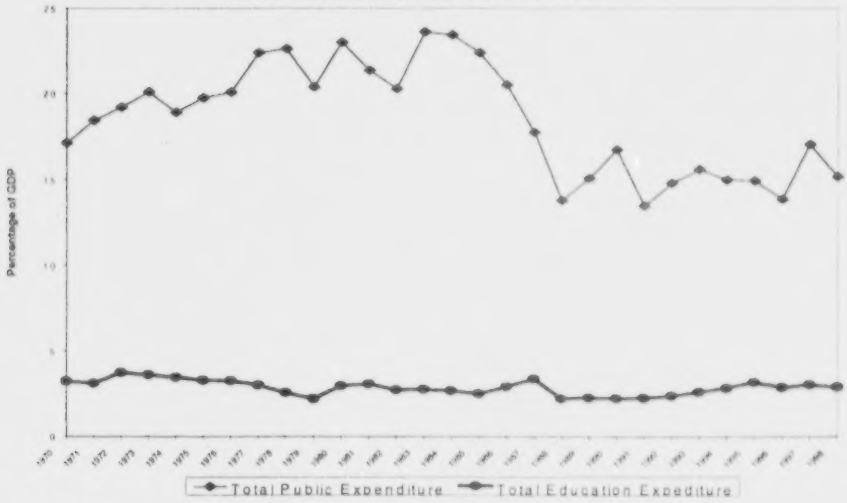
[15] This review of public expenditure on education by Juan Pablo Silva of the Ministry of Education and Arturo Miranda of Universidad de San Marcos has updated and deepened the analysis by Jaime Saavedra, Roberto Melzi, and Arturo Miranda (1998). Jaime Saavedra reviewed the work to ensure consistency in methodology.

[16] This review focuses on direct public expenditure for educational institutions, which coincides with the Government's official account of public education spending. It does not examine public subsidies to households such as school health and school meals, which is funded under the Ministry of Health and PRES, or early childhood care and the literacy program under PROMUDEH. The reason for doing so is to ensure that the scope of discussion remains focused. It is also consistent with OECD's classification, which divides public expenditure into three groups: (a) direct public expenditure for educational institutions, (b) total public subsidies to households and other private entities, and (c) financial aid to students not attributable to households (see Appendix 10.1). When the scope of the review is clearly defined, it would be possible to compare across countries.

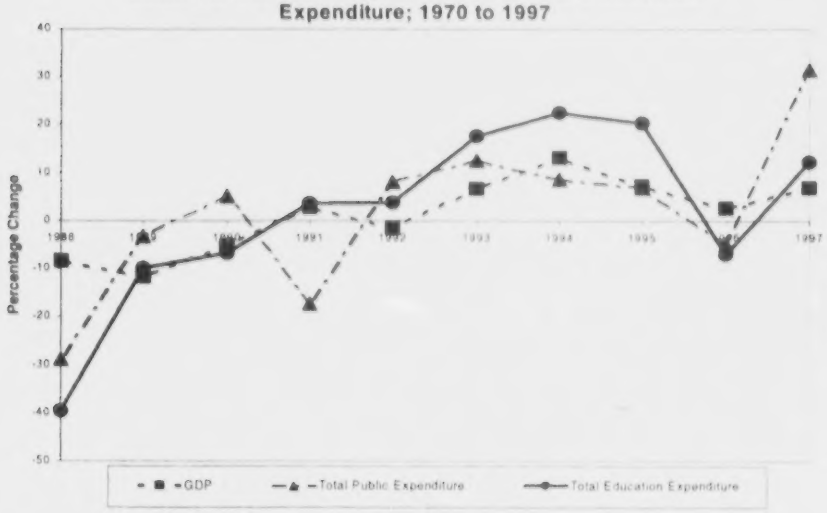
[17] This includes external finance, but not interest payment from borrowing.

Figure 6. Public Expenditure on Education and Central Government Expenditure as a Percentage of Gross Domestic Product, 1970 to 1997



Source: Ministry of Economy and Finance (MEF)

Figure 7. Percentage Change of Gross Domestic Product, Central Government Expenditure, and Public Education Expenditure; 1970 to 1997

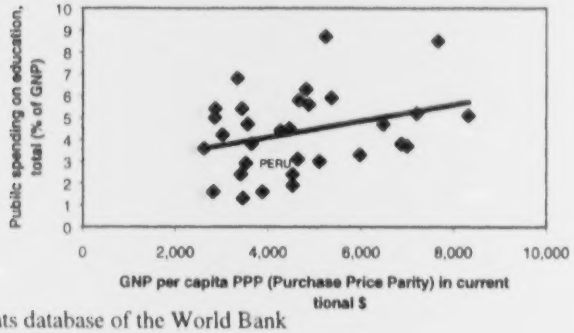


Source: Ministry of Economy and Finance (MEF)

The level of public spending on education in Peru is low in comparison with other non-socialist lower-middle-income countries (Figure 8). It is substantially lower than the Latin American regional average of 4.5 percent of GDP (UNESCO, 1998), or the OECD average of 4.8 percent[18] (OECD, 2000). Because the school-age population of OCED is much smaller than that of Latin America, even if the level of public spending on education as a percentage is similar, the need for educational services is proportionally higher in the latter. In Peru, about one-third of the population are attending schools, in contrast to 16 percent in France and the United Kingdom, respectively, 14 percent in Japan, 28 percent in Mexico, 26 percent in Colombia, and 23 percent in Chile. This comparison makes Peru's level of public spending even lower in both relative and absolute terms.

It should be noted that pensions of retired teachers and administrators are paid out of the recurrent expenditure on education. This accounted for 22 percent of the total education expenditure in 1997. *Net of pensions, public expenditure on education was about 2.4 percent in 1997.* Many countries[19] pay pensions out of a separate fund, such as a provident fund which may be invested in the capital or financial markets to increase the fund, not from the recurrent allocation to the sector. Although public education expenditure that includes pensions reflects the true cost of education, when comparison is made with other countries' spending levels, the proper way is to compare public expenditure net of pensions. This will make Peruvian public spending on education as a percentage of GDP less than half of the region's average for most of the years in the 1990s. While it is a tribute to MED and the teaching profession to be able to sustain such high enrollment ratios at all levels with so little resources, the situation highlights the predicament of the education sector, with adverse implications for quality.

Figure 8: Public Spending on Education and GNP Per Capita in Lower-Middle-Income Countries



Source: Edstats database of the World Bank

[18] The OECD's average cited here refers to educational institution-related expenses, but excludes educational subsidies to households, and student financial assistance.

[19] Paying pensions out of the sector's recurrent expenditure is uncommon, except in socialist countries such as China. The United States, Singapore, Hong Kong, South Korea, Jamaica, Trinidad and Tobago, Colombia, Chile, Mexico, and Argentina pay pensions from a separate fund.

Changes in composition of education spending. What did the additional public expenditure in the 1990s finance? Unlike many countries where most of the increase in public expenditure on education has been absorbed in personnel cost, Peru put the additional resources in educational infrastructure, in quality enhancing inputs (such as textbooks), in teacher training, and in capacity building. For example, the World Bank Project for Improvement of Quality of Basic Education (Mejoramiento de la Calidad de la Educacion Primaria or MECEP in short) finances a class-set of free textbooks for all grades in primary education throughout the country.

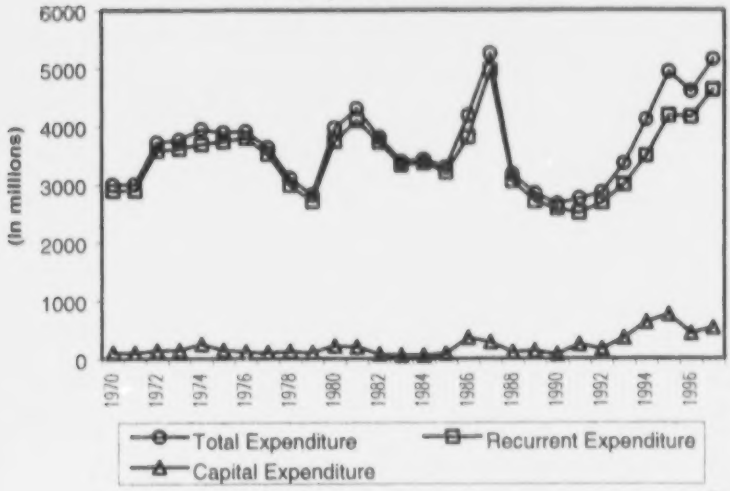
Capital investment increased from 1.4 to 15 percent of total public expenditure on education between 1990 and 1994, and then gradually fell back to 8 percent in 1997. Spending on other capital goods also increased from 1.4 to 2.1 percent. Spending on goods and services as a percentage of total education expenditure more than doubled from 4 to 10 percent, and other recurrent costs also more than doubled from 0.7 to 1.8 percent. It should be noted, however, that the fluctuation in nonpersonnel education expenditure still bore the mark of unpredictability, which undermines planning and implementation (Figures 9 and 10 and Appendix 6.7).

By contrast, total personnel cost (remuneration and pensions) increased by 64 percent, substantially below the 94 percent increase of total public expenditure (Appendix 6.7). As a result, the percentage share of personnel cost was reduced from 92 to 78 percent of total public spending during the period. Net of pensions, compensation for teachers and administrators (which includes salaries, allowances, and contribution to future pensions) accounted for under 60 percent of total public expenditure. This is substantially below the personnel expenditure of most lower-middle-income countries.

Intragovernmental transfer of resources is the area where the most far-reaching change in education finance has occurred. The Government in 1991 initiated a policy to transfer public funds directly to the regions. In 1990, the MED managed 71 percent of the public education expenditure, the regions 17 percent, the universities 10 percent, other public institutions 1.6 percent, and the PRES 0.3 percent. By 1997, only 25 percent of public expenditure was managed by MED, as 56 percent was transferred directly to regions, 16 percent to the universities, 2 percent to other decentralized public institutions, and nearly 4 percent to the PRES (Figure 11 and Appendix 6.5). Given that such a large share of public expenditure on education is transferred to the regions, the universities, decentralized institutions, and PRES, the case for strengthening coordination among these bodies for policy and resource allocation is even stronger.

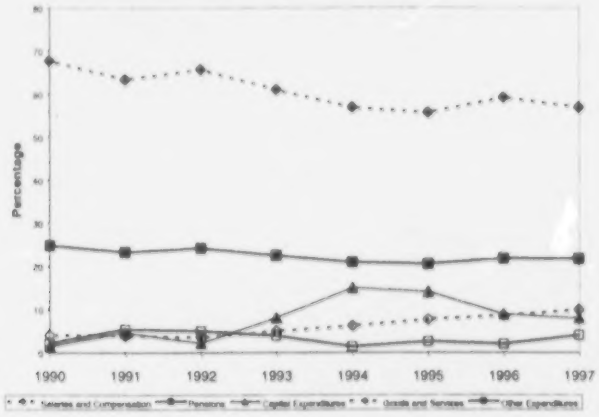
The departments can generate their own resources to invest in education, most of which are used to purchase goods and services, for administrative purposes, or for post-secondary education. However, the departments' capacity is limited, and they depend heavily on transfer from the central government (Appendices 6.11 to 6.17). In 1997, central transfer accounted for 100 percent of pensions, almost 100 percent of all salaries in administration, planning, initial education, primary education, secondary education, tertiary education, and special education. PRES provided most of capital expenditure in primary and secondary education in the country.

Figure 9. Total Recurent and Capital Expenditures on Education 1970 to 1997 (in constant 1997 soles)



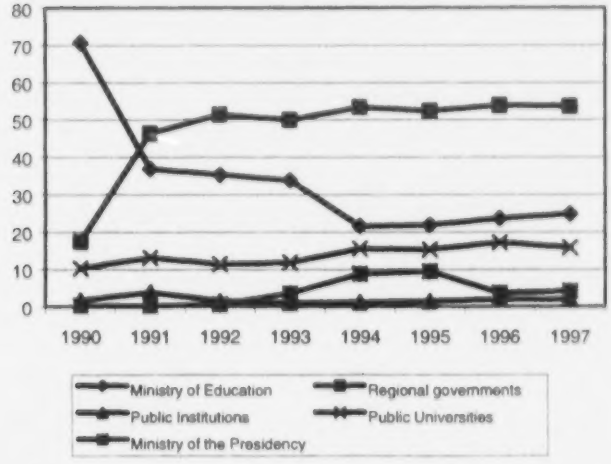
Source: Ministry of Economy and Finance (MEF)

Figure 10. Composition of Public Expenditures on Education, 1990 to 1997 (Percentage, Regrouped According to the Lastest Classification)



Source: Ministry of Economy and Finance (MEF)

Figure 11. Inter-Governmental Transfer of Resources (Percentage of Total), 1990 to 1997



Source: Ministry of Economy and Finance (MEF)

It should be noted that pensions are paid through the department where the retiree resides, not where he/she used to teach. That is why the share of pensions as a proportion of total public expenditure varies from one department to the next. In 1997, pensions accounted for 32 percent of MED's total expenditure, about 21 percent of the region's expenditure, but 14 percent of total university expenditure. Since MED has jurisdiction over Lima/Callao, 43 percent of the total pensions of the education sector were paid out of Lima/Callao, and the rest through other departments. (Appendix 6.8)

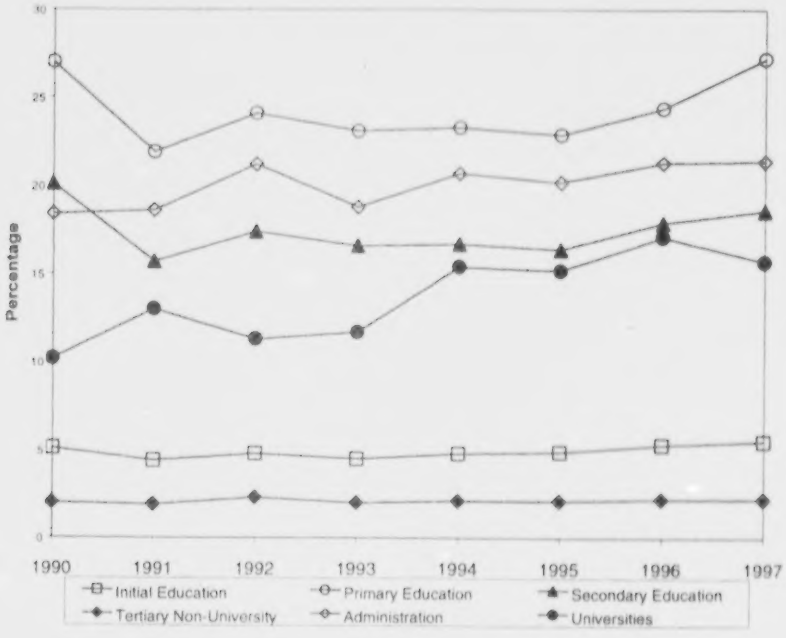
Intrasectoral allocation. Among various subsectors, public universities are the only one which has benefited from uninterrupted increase in public expenditure (from about 10 to 16 percent) between 1990 and 1997. In 1997, about 6 percent of total public expenditure was spent on initial education, 27 percent on primary education, 19 percent on secondary education, 2 percent on nonuniversity tertiary education, 16 percent on university education, and 21 percent on administration. (Figure 12 and Appendix 6.9).

It should be noted that administration expenditure includes compensation to all principals, school administrators, and inspectors at all levels of education. Disaggregated information on administration is not available to pro-rate it to various educational levels. That makes spending by each level low and administration rather high. For comparison, OECD countries classify the salaries of all administrative personnel as personnel cost, not as administrative cost (Appendices 10.1-10.5).

Per student spending. Between 1990 and 1997, per student recurrent public spending steadily increased at all levels. It grew by 70 percent in initial education, 87 percent in primary education, 71 percent in secondary education, 79 percent in tertiary nonuniversity education, and 335 percent in university education. While the percentage increase was impressive, it started from a very low base (Figure 13 and Appendix 6.10). For university education, the very low per student spending in 1990 signaled poor quality. The rapid increase in per student spending throughout the 1990s, however, reflected not only additional public allocation to this subsector, but also reduced enrollment in public universities. Whether increased resources to improve quality of university education should come from the public or private sector will be discussed in Chapter 3.

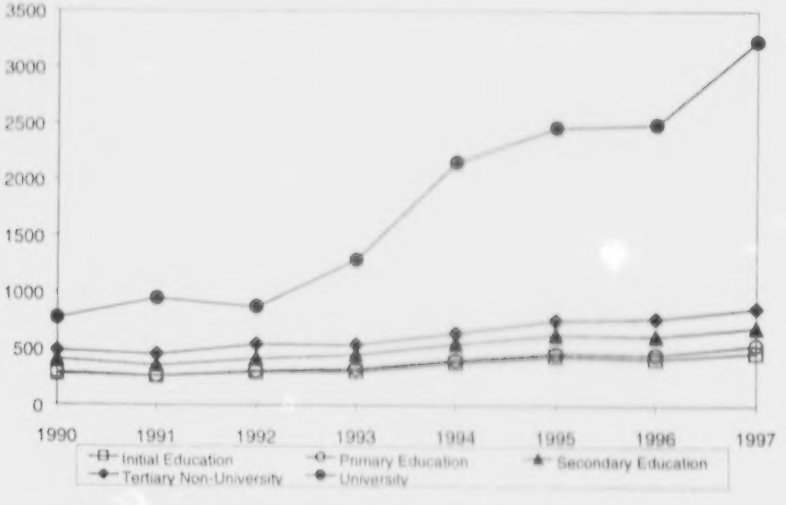
Converted to US dollars, per student public spending (inclusive of expenditure on pensions) in 1997 was US$175 in initial education, US$201 in primary education, US$260 in secondary education, US$324 in nonuniversity tertiary education, and US$1,255 in university education (Appendix 6.10). The difference in public spending per student between higher education and primary education in Peru was 6 times. Since the distribution of pensions differs by level of education, expenditure net of pension that goes to operating the university system is much higher than the gross figure, whereas expenditure net of pension that goes to basic education is lower than the gross figure. Net of pensions, per student spending on university education was 7 times higher than that of primary education in 1997. Nevertheless, this differential is still lower than that in many countries of Latin America (which may be as high as 20 times). In many countries in the region, public expenditure on higher education per student is often above $2,000.

Figure 12. Public Expenditure on Education by Level, 1990 to 1997 (Percentage)



Source: Ministry of Economy and Finance (MEF)

Figure 13. Per Student Recurrent Public Expenditure on Education by Level, 1990 to 1997 (Constant 1997 Soles)



Source: Ministry of Economy and Finance (MEF)

Equity of distribution of public expenditure. How equitable has the distribution of public expenditure been? A standard method to measure the incidence of public expenditure is to construct a Lorenz curve[20] to show the proportion of education expenditure which accrues to each consumption or income quintile. (This report uses consumption quintiles throughout).[21] Since capital expenditure varies from year to year, only recurrent expenditure for 1997 was used in the incidence analysis.

Figure 16 shows a number of Lorenz curves with recurrent public expenditure disaggregated by level of education.[22] This analysis included expenditure on pensions. Recurrent public expenditure on preprimary and primary education was skewed toward the lowest consumption quintile (29 percent) and that on higher education was skewed toward the highest consumption quintile because the vast majority of students (47 percent) in higher education were from the top quintile and only 4 percent were from the bottom quintile. (Appendix 4.4a.)

Public expenditure on primary education is equity enhancing not only because of the universal enrollment in primary education, but also because many families in the top two quintiles have opted out of sending their children to public preprimary, primary, and secondary schools, leaving the public system mainly to the less well-off (Appendix 4.2a–4.2d, and 4.3a–4.3d). However, the top quintile is the major user of public universities because children from that group have been better prepared for it and cand afford to forgo the income to pursue further education. That is why public spending on the preuniversity level is more equitable than that on university education.

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[20] The Lorenz curve is read as follows: the heavy straight black line joining the two corners as shown in Figures 14–16 is the line of "perfect equality" or the line which would obtain if each consumption quintile received an equal amount of educational expenditure—for instance, if 20 percent of expenditures accrued to the poorest quintile just as to the richest quintile. The curved line(s), the Lorenz curve(s) shown in these figures, represent the actual distribution of expenditures. The closer the curves are to the diagonal, the more equitable is the distribution of expenditures—in Figure 14 the curved line is very close to the diagonal, and the claim can be made, subject to certain assumptions, that public education expenditures in Peru are equitable.

[21] The methodology for undertaking this analysis is simple. A table is constructed which shows the enrollments from each quintile, separately for each level of education. The number of students in each of the cells in the table is then multiplied by public expenditure per student on that level. This method is to get around the lack of data on actual expenditure per student by quintile. It assumes that the same amount of public expenditure is spent on a child from a poor family as for a child from a rich family. It does not adjust for the difference in teacher-student ratios in rural and urban areas.

[22] The heavy straight black line in Figure 16 shows the line of equality. This figure indicates that public expenditure for the preprimary and primary levels is not only equitable, it is actually biased towards the poor, so that more public expenditures accrue to the poor than to the rich. The diagram also shows that higher education expenditures are very inequitable, especially for university education. Interestingly, equity does not appear to be too much of a problem for secondary education—the broad dashed line for the Lorenz curve for secondary education falls close to the diagonal.

Figure 14 shows that when recurrent public expenditures per student at all levels were combined, overall recurrent public spending was distributed quite equitably. The three lowest quintiles each received over 21 percent of the recurrent public expenditure on education, while the top quintile received 17 percent (Appendix 4.4a). This curve, which includes pension expenditure, is also referred to as Simulation 1 in Figure 15.

Since the distribution of pensions differs by level of education, Simulation 2 in Figure 15 tested what the Lorenz curve might look like without pension expenditure. The simulation took an average of 26.5 percent of pension expenditure out of preprimary, primary, secondary, and nonuniversity spending per student, and 13.5 percent out of university spending per student (Appendix 4.4b). The curve of Simulation 2 looks less equitable, but is not significantly different from Simulation 1 (Appendix 4.4b). This simulation is closer to the true picture (assuming that similar proportion of teachers are retired from the various groups).

Still, both Simulations 1 and 2 were built on the assumption that the public spending per student in each level of education was uniform across all quintiles.[23] However, the variation of public expenditure per student by department indicates that this assumption is unlikely to hold. In 1997, for example, the average public recurrent expenditure on primary and secondary education per student in the poor Department of Huancavelica was only 40 percent that of the national average, in contrast to richer Moquegua and Tumbes which had a level of per student spending that was about 160 percent of the national average (Appendix 6.18). This variation may be attributable to three reasons: (i) the pension burden (which is included in the expenditure) is much smaller in the poorer, interior department but much heavier in the richer, coastal departments; (ii) the ability to generate their own resources varies between departments; and (iii) since resources are based on student-to-teacher ratios, the freeze of pensionable positions in 1995 put departments with high birth rates at a disadvantage. Whatever the causes might be, the assumption of uniform per student spending is questionable.

Simulation 3, therefore, varied the per student spending by quintile. The simulation held the public spending per student of the middle quintile constant for all levels of education, but reduced that of the second quintile to 15 percent below that of the middle quintile, and that of the first quintile 30 percent below that of the middle quintile. By the same token, per student expenditure of the fourth quintile was raised 15 percent higher than that of the third quintile and the top quintile was 30 percent higher (Appendix 4.4c). Although the choice of these percentages for the simulation already reduced the variation in per student spending in the Departments by more than half, the Lorenz curve of Simulation 3 is still dramatically more unequal.

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[23] An account of the criticisms and the relevance of studies about the incidence of benefits can be found in "Assessing the Welfare Impacts of Public Spending," by Dominique van de Walle, *World Development*, 1998.

Figure 14. Lorenz Curve for Incidence of Public Expenditure

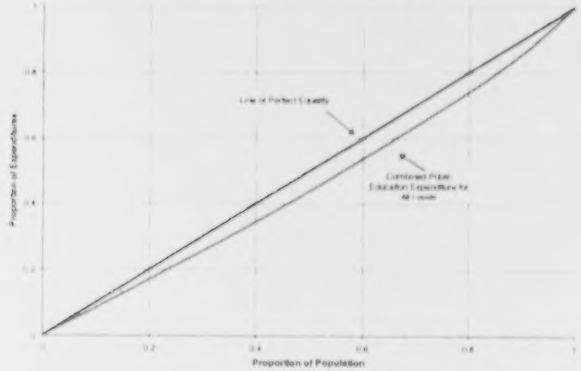
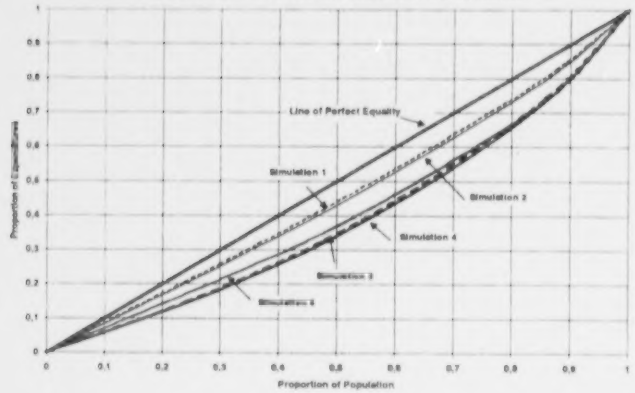
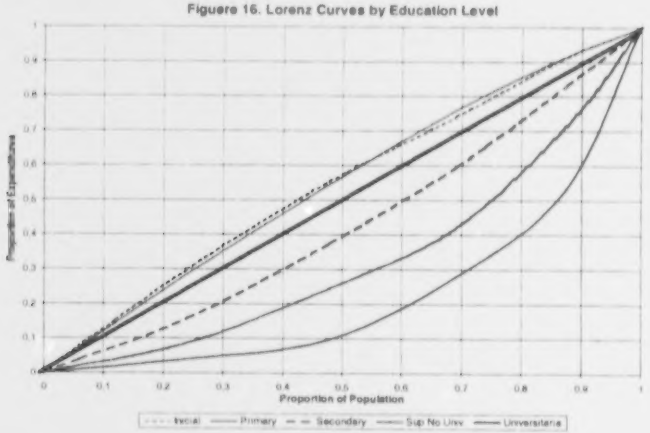


Figure 15. Lorenz Curves for Incidence with 5 Simulatios



Figuere 16. Lorenz Curves by Education Level



Source: World Bank Analysis of Household Survey by Instituto Cuanto, 1997

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Simulation 4 combined the principles of Simulations 2 and 3 and repeated the same experiment after taking out the pensions. Predictably, the distribution is the worst among all simulations (Figure 15 and Appendix 4.4d).

Simulation 5 asked: if per student public expenditure on higher education was much higher than the current level, while per student spending at all other levels remained the same, how inequitably would public resources be distributed? The Lorenz curve of this simulation is almost as unequal as those in Simulations 3 and 4. This shows that the relatively low public expenditure on university education per student is an important reason for the overall Lorenz curve to look equitable in Simulations 1 and 2 (Figure 15 and Appendix 4.4e). However, if school resources are distributed inequitably across quintiles, no matter how high enrollment ratios are in basic education, the Lorenz curve will look worse.

This exercise shows that the equitable overall showing of the Lorenz curve (Simulations 1 and 2) can be attributable to three reasons: (i) universal primary education benefits the poor more than the better-off; (ii) the better-off have opted out of public schools, thereby consuming less of public subsidies; and (iii) public spending on higher education per student is relatively low. The system could be extremely unequal, if per student allocation in any given educational level is less for lower quintiles than upper quintiles, and if public expenditure allocated to universities continues to escalate.

If capital investment is taken into account, the distribution of public expenditure is likely to be even more inequitable. The negligible historical capital investment has resulted in a highly inadequate learning environment. Historical investment in school infrastructure and equipment tended to favor large urban schools, the argument being to bring the greatest benefit to the largest number of pupils. As a result, urban schools are better endowed than rural schools. In the mid-1990s onwards, the National Social Fund (Fondo Nacional de Compensación y Desarrollo Social or FONCODES in short) which was administered under PRES has responded to the demands of rural communities. INFES is also building schools in rural areas.

Summary. The exercises in this chapter found that public resources have been very low, although *relatively* well-targeted and well-used within the overall constraints. The pattern that emerged in the 1990s of a modest but steady increase in public spending on education reflects both commitment to education and fiscal restraint. The Lorenz curve constructed from using uniform per student expenditure for all quintiles suggests equitable distribution of public expenditure, although the absence of actual cost data by quintile leaves lingering questions on the methodology. Future investigation should collect data on the actual amount of public resources spent on students from different quintiles to shed light on this question. Furthermore, the largest increase in per student spending in the 1990s is that on public universities, and yet the majority of students in this level are from upper quintiles. This trend should be monitored closely to ensure that public resources are targeted to the truly disadvantaged. Given that the level of public spending on education is still low in absolute and relative terms, to expand access and improve quality for the poor, additional and targeted investment needs to be sustained for a long time in order to equalize educational opportunity.

2.3. Household Expenditure on Education

With respect to the second question of whether Peruvians value education and have invested heavily in the education of their children, the answer is unequivocally affirmative. Historically, communities built schools and organized learning long before the Government began to play a key role in financing or provision of education.

This was borne out by the high level of household spending on education, totaling to about 2 percent of GDP,[24] according to analysis of household surveys of 1994 and 1997. This level of household expenditure is higher than the 1.3 percent of GDP spent by OECD countries, also higher than Argentina's 0.75 percent and Mexico's 1.1 percent, but lower than Chile's 2.6 percent, Colombia's 3.6 percent, and Jamaica's 6 percent.[25] It should be noted that composition of household expenditure on education may vary from country to country. Since household expenditure estimates are obtained from household surveys, how the questionnaires are phrased affect the information obtained. The cross-country information provided above is intended to show the range of household expenditure on education. It should be not be taken as comparable.

The key question is *not* whether households in Peru spend too much or too little but *what this level of spending by households* ***implies*** *for educational policy in Peru.* Understanding the breakdown of expenditures across consumption quintiles would provide an answer to the question of whether certain groups of Peruvians are deprived of educational benefits because they are too poor to afford the necessary expenditure. Secondly, it is important to address the question of what variables determine the variation in expenditures across households—this would aid in understanding the implications for educational development in the future.

Disparity in household spending on education by quintile. Figure 17 shows the Lorenz curve for total private expenditure, which looks very dissimilar to the equitable Lorenz curve for total public expenditures in Figure 14, but looks very similar to the very inequitable distribution of expenditure on public universities in Figure 16. The expenditures are indeed inequitable, with the lowest quintile accounting for only about 4 percent of the total household expenditures on education, and the upper quintile as much as 57 percent. This Lorenz curve for all private expenditures does include spending on private schools.

Figure 18 shows the Lorenz curve of household expenditure which is spent only on public schools. However, the curve is only slightly better. Peruvian households spent ap-

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[24] In 1997, household spending on education amounted to about US$1,300 million (Appendix 7.14). Given Peru's GDP in that year of US$65,221 million, household expenditure on education was about 2 percent of GDP. This was consistent with the findings by Saavedra, Melzi, and Miranda in the analysis of 1994 household survey.

[25] OCED, *Education at a Glance*, 1998; Colombia, Departamento Nacional de Planacion, 1996; Chile, Ministerio de Hacienda and Banco Central, 1998; World Bank, 1999d, *Jamaica: Secondary Education: Improving Quality and Extending Access*, Report No. 19069.

proximately $781 million (41 percent) for the education of children who were enrolled in public schools to complement the public spending on education that was about $1,932 million. These household expenditures include registration fees and contributions to parents' associations (Asociacion de Padres de la Familia or APAFA in short), uniforms, school lunches, and transportation.[26]

Figure 19 shows the Lorenz curve of household expenditure on public primary schools; the situation is only worse in regard to secondary schooling. The level of household expenditure on education varies tremendously by income level—the total amount spent on education by the richest quintile in Peru was 13 times the total amount spent on education by the poorest quintile. (Appendix 7.14.) Even this figure is likely to be underestimated because the household survey questionnaire which provided the data for analysis did not include spending on extra tutoring and other school activities such as field trips.

It is far more difficult for poor families to provide sufficient educational inputs for their children. For example, spending on books accounted for 35 percent of total household expenditure on public primary education for the poorest quintile, but only 11 percent for the richest quintile whose children attend private schools (Appendix 7.2). In the case of primary education, the average out-of-pocket cost for parents of the top quintile to send their children to a public primary school was 194 soles (US$73), or 2.2 times the amount spent by the poorest quintile, which was 88 soles (US$33). The average cost per child in the richest quintile in a private school was 1,645 soles (US$618), amounting to 19 times the average cost spent by households in the poorest quintile on public primary schools (Appendix 7.2).

Since public expenditure covers mostly salaries, household contributions in school fees and to the APAFA are often used by schools for repair and maintenance, educational materials and supplies, and water and electricity. The disparity in the ability of parents to pay, therefore, has contributed to the disparity in school resources. Appendix 4.6 presents the result of a survey of some 400 rural and urban public schools in Lima and Cusco by MED in 1994. It shows that the annual APAFA contribution to very large urban schools (with an average of over 1,600 students) amounted to 11,735 soles, in contrast to only 279 soles of contribution to small rural schools (with an average of 96 students).

This survey confirmed the disparity in school resources among very large, large, medium, and small urban and rural public schools[27] (Appendix 4.6). To cite a few examples, 81 percent of very large urban schools have a library, compared to 26 percent of small rural schools; 82 percent of very large urban schools have brick or cement walls,

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[26] Unfortunately, the data was recorded on the questionnaire instrument of the household survey in such a way that it is not possible to separate out items such as bus tickets from the direct transfer of resources to schools through items such as APAFA fees.

[27] This was based on the MED's survey in Cusco and Lima conducted in 1994. Although the situation might be different now, it is unlikely to have changed so dramatically that it alters the picture.

compared to only 21 percent of small rural schools; 79 percent of very large urban schools have electricity, compared to 37 percent of small rural schools; and 76 percent of very large urban schools have latrines that work, compared to 32 percent of small rural schools.

Appendix 4.5 also illustrates how the disparity in the ability of parents to pay is translated into inequity in resources of schools attended by children of different quintiles (proxied by water and drainage). Note the high percentage of both public and private schools attended by poor children in the first and second consumption quintiles that lacked either water or drainage or both, in contrast to those schools attended by children in the top quintiles. Poor children attend schools with little resources, be that public or private.

Elasticity of demand for education. Notwithstanding the aforementioned fact, Peruvians value education highly and would go to great lengths to make sure that their children have an education. Analysis of the behavioral aspect of household education expenditures (Engel's curves) found that the income elasticity of demand is a low 27 percent (See Background Note 2).[28] This means that *education expenditure is considered to be a necessity by Peruvian households and that there is a strong underlying demand for education, by both rich and poor.*[29]

To make sure that the conclusion was not based just on one pooled set of regressions, the regressions were run separately for subsamples by indigenous and nondigenous, rural and urban, and poor and rich. Consistently, the pattern is that the income elasticities are lower for the more disadvantaged groups. It was 12 percent for the poorest quintile, 14 percent for rural populations, and 10 percent for indigeneous people.

The finding resonated with that of Rodriguez and Abler (1998) for a sample of Peruvian children 6 to 16 years old. They found that even if there is a positive relationship between income of the family and the probability of school attendance, the estimated marginal effects are small. Moreover, the magnitude of the negative effect of family income over participating in the labor force is also small. That is why overall enrollment did not decline, and child labor did not increase, during the time of economic crisis. The study by Gertler and Glewwe (1989) had similar findings: that rural Peruvian households were willing to pay fees high enough to more than cover the operating costs of new secondary schools in their villages. This is even true of the poorest quarter of the income distribution.

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[28] See Deaton and Case (1988) and Sadoulet and de Janvry (1995). The specification used here also borrows heavily from a Yale University Working Paper by Mwabu (1994), *Household Composition and Expenditures on Human Capital Inputs in Kenya*.

[29] Mwabu's work on Kenya indicated a much higher income elasticity of education expenditures of 73 percent.

Figure 17. Lorenz Curve for Incidence of Private Expenditures All Levels

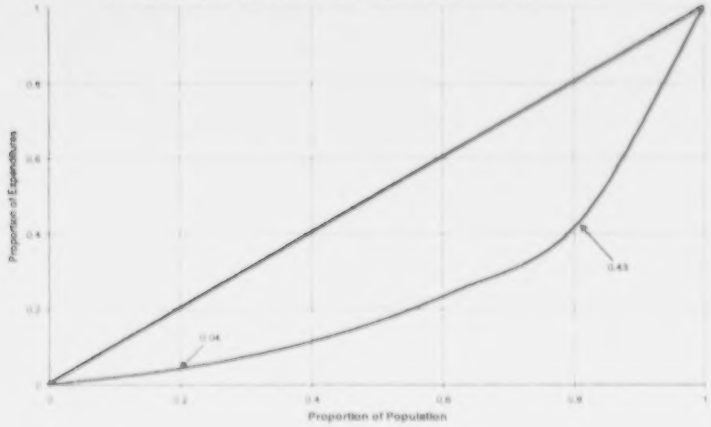


Figure 18. Lorenz Curve for Incidence of Private Expenditures
Only Public Schools

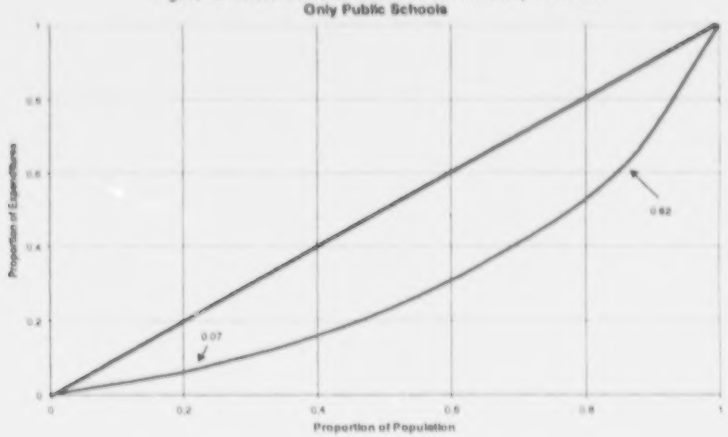
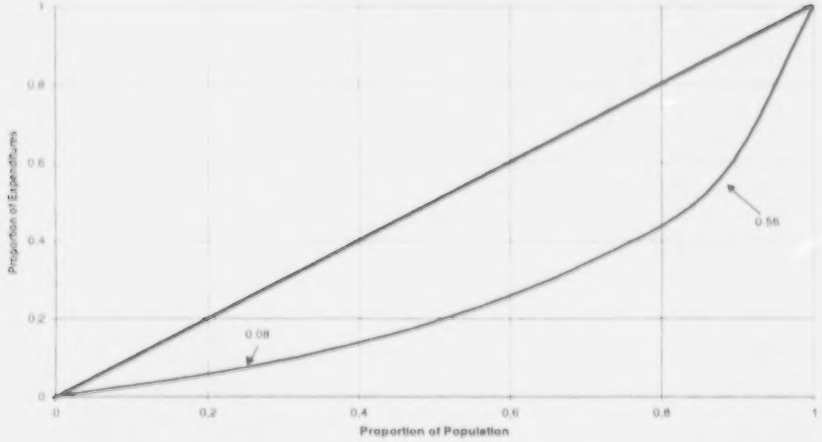


Figure 19. Lorenz Curve for Incidence of Private Expenditures
Only Primary Schools



Source: World Bank Analysis of Household Survey by Insituto Cuanto, 1997

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From the point of view of educational policy, however, the Government cannot rely on general increases in income to bring about greater expenditures on education to improve educational quality for disadvantaged groups. For every doubling of household income, the budget share spent on education would go up only by a quarter on average; for the poor, the rural people, and the indigenous people, their budget share in education would only go up by 10 percent or so. Given that levels of household expenditure on education vary vastly by income level, there is a great need for specific policy instruments that will address the inability of poorer households to incur additional expenditures.

Conclusion. Because the burden for financing education is disproportionately heavier for poorer households than richer households, the public sector has a special mandate to ensure the equality of educational opportunity for all by directing more public resources to the poor. Past constraints on public expenditure allow exercising this mandate without exceeding reasonable overall public allocations to the sector.

3. System Performance Indicators

This chapter reviews indicators on educational access, internal efficiency, quality, and labor market outcomes in order to address the question of whether expansion of education in the past has come at the expense of quality, and to assess the implications for policy in the future.

3.1. Access, Repetition, and Retention

Household surveys have repeatedly found evidence of near universal enrollment in primary education for children between the ages of 6 and 11.[30] This is reflected in very high gross enrollment ratios. Access to early childhood, secondary, and tertiary education, however, varied tremendously by socioeconomic status, gender, and urban or rural location. In general, both males and females between the ages of 12 and 17 in rural areas, irrespective of consumption quintile, are less likely to be in school than their counterparts in urban areas. For the 17 to 25 age group, girls in rural areas definitely have fewer opportunities than boys of the same consumption quintiles in the rural areas or girls in the urban areas. (Appendices 4.1a– 4.1b).

It should be noted that these gross enrollment ratios indicate how many students of all ages are studying at a given level; it encompasses late entrants, under- and over-aged students, repeaters, and adult learners. Gross enrollment ratios, therefore, often exceed 100 percent. Net enrollment ratios, however, indicate what percentage of children of a particular age group are studying in the level designated for that age group. It never exceeds 100 percent and is a more accurate measure of the amount of schooling acquired by the age group. *Where large differences exist between net and gross enrollment ratios, they signal that a large proportion of students are late entrants and repeaters.* It is, therefore, very telling that gross enrollment rates in the rural areas among lower quintiles are higher (over 110 percent) than even their counterparts in the same quintile in urban areas. The gross enrollment of the top quintile in urban areas is under 99 percent, showing that

[30] There are two major institutions in Peru that have conducted regular household surveys and which provide databases for analyzing education indicators: INEI, which is under the GOP, and Instituto Cuanto, which is a privately run organization. INEI conducted a school census in 1993 and another one in 1998. Most of the official education statistics including enrollment ratios and average years of schooling are drawn from INEI's data. This report, however, draws from the household survey of 1997 conducted by Instituto Cuanto because its questionnaire is richer and also because the World Bank's other studies (on poverty and labor market) also drew from this dataset. It should be noted that Instituto Cuanto's sample size is much smaller than INEI's, and its sample frame is different. For this reason, indicators on access, repetition, and retention reported in this report are not the same as those reported in government statistics. Nonetheless, the broad picture revealed by data from Instituto Cuanto is similar to those by INEI. Subsequent to this analysis, the Ministry has undertaken other assessments and made the information public. The reader should also refer to information posted in the Ministry's new website: http://www.minedu.gob.pe.

they move through the system rapidly without wasting time in it. (Appendices 4.1a and 4.1b).

Peru's net enrollment ratios are much lower than the gross ratios, averaging in the rural areas only 10 percent in initial education, 65 percent in primary education, 28 percent in secondary education, and 4 percent in tertiary education. These are lower than the urban areas' 12 percent in initial education, 71 percent in primary education, 57 percent in secondary education, and 22 percent in tertiary education. Net primary education enrollment differs substantially by income quintile and gender within and between urban and rural areas. The difference was most pronounced at the tertiary level, where, in the rural areas, only 1.6 percent of girls and 2.5 percent of boys of the first quintile enrolled, in contrast to 12 percent of girls and 7 percent of boys in the same quintile in the urban areas. (Appendix 4.1c and 4.1d).

Rural children tend to enter late into the school system because they often have to walk to school. As schools are usually established in population centers, allowing for 1.5 to two hours' walking distance from other settlements, only older children who can endure the journey can go to school. As a result of their late entrants and high absenteeism (due to the need to help their families and to vulnerability to climatic factors), they also tend to have high repetition rates. Research has found a clear association between late entry and high repetition rates on the one hand, and poverty, indigenous language speakers, and uneducated mothers on the other. About 63 percent of Quechua speaking children are over-aged. For children who work in the countryside, 68 percent are over-aged, and the dropout rate among them is as high as 55 percent (Montero, 1996).

Official statistics on repetition[31] and dropout are highly aggregated, without gender or urban and rural breakdown. In the aggregate, 80 percent of a cohort reached Grade 6, while 60 percent of the same cohort reached Grade 11. However, only 40 percent of Grade 6 students and 20 percent of Grade 11 students had not repeated during their course of study. Dropouts spent an average of 6.7 years in the system (Appendix 4.7). To obtain a picture of the differential repetition and dropout rates by the rich and poor, household survey data are used.

The analysis by Saavedra and Felices (1997) of the 1994 Cuanto household survey confirmed the relationship between repetition and income—the percentage of repeaters went from 17 in Lima, to 24 in other urban areas, and rose further to 35 in rural areas. Repetition is also much higher in public schools than in private schools. The study also revealed the relationship between income and status dropout (defined as the proportion of individuals in a cohort that have not finished an educational level and are not enrolled in any educational institution). For those aged 17 to 24, the status dropout rates were 13 percent in Lima, 20 percent in other urban areas, and 54 percent in rural areas.

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[31] The MED has adopted a policy of automatic promotion in lower grades in primary education since 1998. Therefore, repetition rates are not good indicators of whether students have mastered the requisite skills for a given grade level.

An analysis of Instituto Cuanto's household survey of 1997 found a large disparity in school survival rates[32] between urban and rural areas. Figure 21 shows that although urban and rural children started out the same in the first year of schooling, they rapidly diverged after the Fourth Grade. Figure 23 displays a similar pattern of school survival rates between children from the top and bottom quintiles. In both cases, disadvantaged children (that is, rural and poor) dropped out much earlier.

School survival rates did not differ much by gender (Figure 20) but disparity was significant between children whose mother tongues are indigenous languages, and those who are Spanish speakers (Figure 22). In comparison with the school survival gap between rural and urban areas, the indigenous gap appears to be smaller. However, this may simply reflect the reluctance of people to identify their own mother tongue (which is the variable often used to construct indigenous and nonindigenous populations). That the school survival rates of Spanish-speakers were much lower than those of urban dwellers seems to lend support to the above-mentioned point.

Conclusion. High repetition and low retention rates indicate low internal efficiency of the system. This means that children spend time in the system without attaining the education level and mastering the skills commensurate with the number of years of enrollment. This is not only a waste of public and household resources but also has grave consequences for the future employment prospects and lifetime earnings of children. The solution is not to adopt a policy of automatic promotion but to ensure that children learn the skills relevant to the grade-level every year by a range of policy options to be discussed in Chapter 5.

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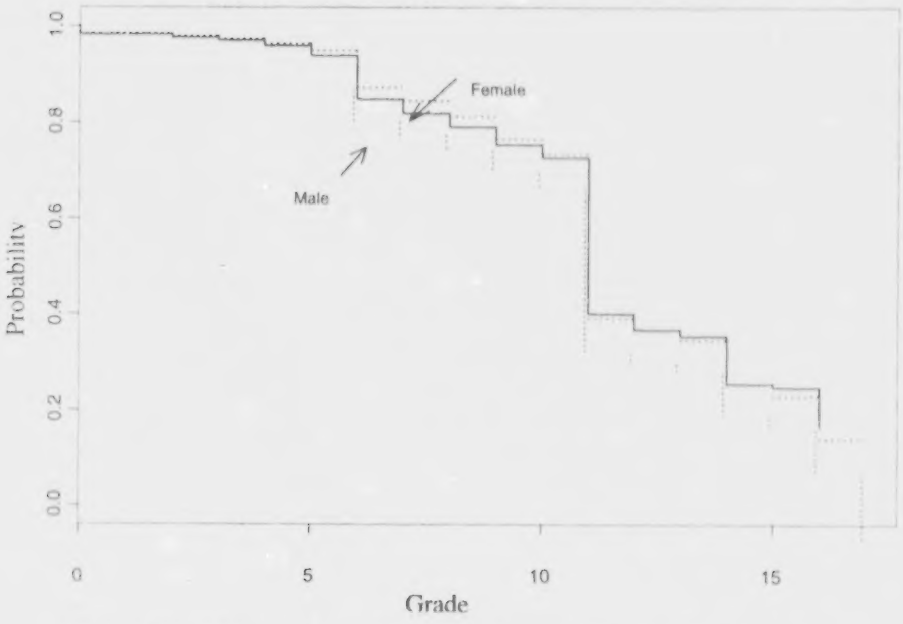
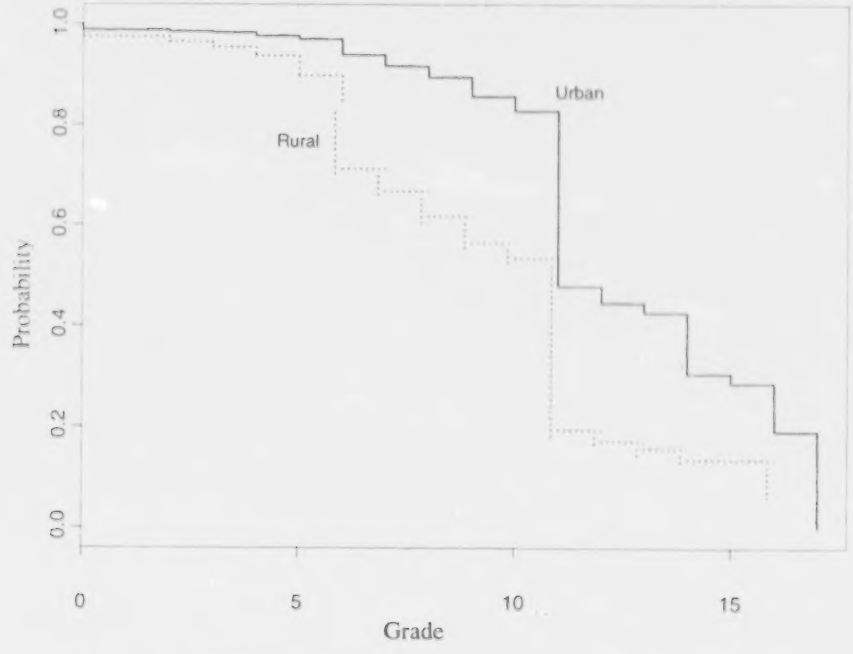
[32] The survivor function plots in Figures 20 to 22 are known as "Kaplan-Meier Survivor Functions." They are nonparametric maximum likelihood estimates of the survivor function. (See *The Statistical Analysis of Failure Time Data*, by J.D. Kalbfleisch and R.L. Prentice, John Wiley and Sons, 1980). The survivor function uses information about the years of schooling completed and the current status of enrollment at school. It is the complement of the empirical cumulative distribution function. The Kaplan-Meier plot is not based on any regression model—the figure simply represents a count of people as they leave the educational system compared to the number of people who stay on. The numerator is the number of people who stay on, and the denominator is the number of people who have been in school up to the time. Hence, the plot always begins at a value of 1, since every one stays on at the first instant, and subsequent "steps" on the figure show people leaving. There is one underlying assumption, that if you have left school, you will not enroll again at a later date. This assumption is more valid in some cases than others, but it is a fairly standard one in the literature on educational attainment.

Figure 20: School Survival Rates by Gender, 1997



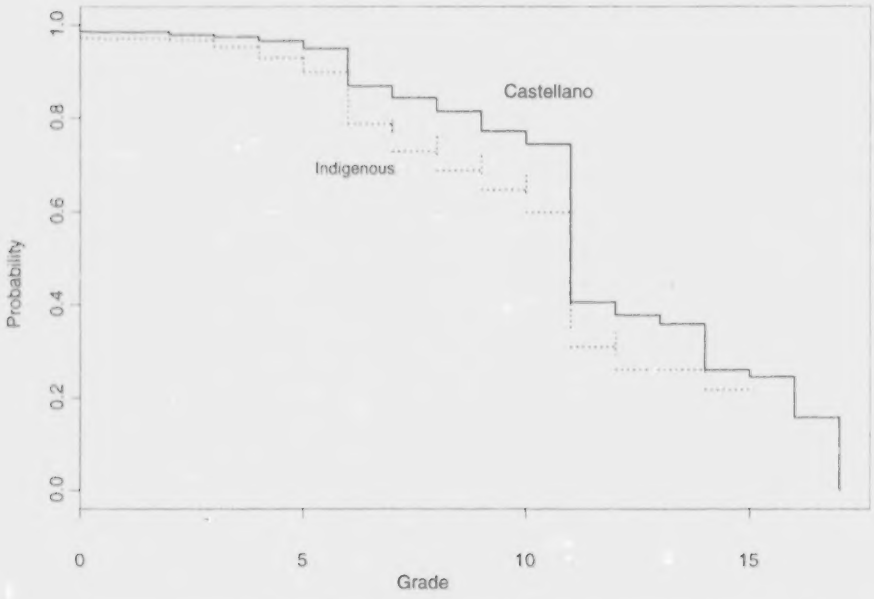
Source: World Bank Analysis of Household Survey by Instituto Cuanto, 1997

Figure 21. School Survival Rates by Urban and Rural Areas,1997



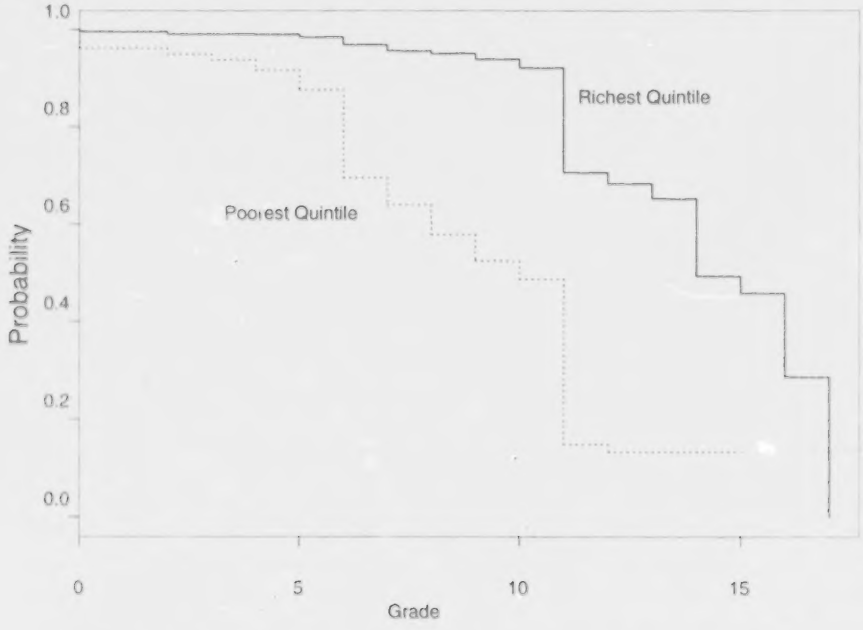
Source: World Bank Analysis of Household Survey by Instituto Cuanto, 1997

Figure 22. School Survival Rates by Mother Tongue, 1997



Source: World Bank Analysis of Household Survey by Instituto Cuanto, 1997

Figure 23. School Survival Rates by Poorest and Richest Consumption Quintiles, 1997



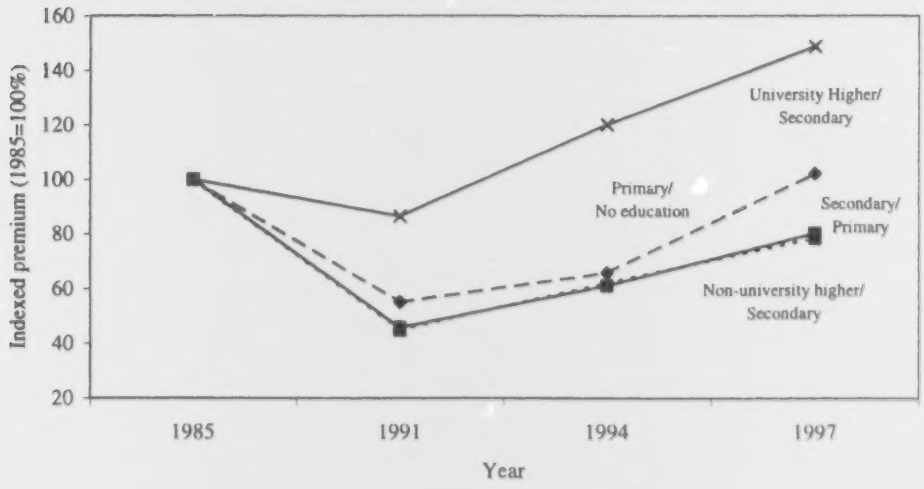
Source: World Bank Analysis of Household Survey by Instituto Cuanto, 1997

3.2. Labor Market Outcomes

The consequence of low internal efficiency will impact on external efficiency (labor market outcomes). This will become even graver in the 21st century as the trend of the 1990s has already shown rapidly increasing wage differentials among workers with various education levels. After falling between 1985 and 1991 during the economic crisis, the premia of all education levels bounced back in recent years after the implementation of structural reform and opening of the Peruvian economy (Saavedra, 1998). The magnitude of decline between 1985 and 1991 was different among workers of different education levels—it was minimal for university educated workers but was almost halved among workers with other levels of education. When the premia bounced back in the 1990s, the increase was also steepest for university graduates.

Figure 24 shows that in urban areas, in 1997, the earnings differentials between workers who had no education and those who had primary education barely recovered to the level of 1985. Improving quality of primary education will provide some real benefit to those who would only have this opportunity to acquire the requisite skills that distinguish them from workers with no education. The premia of secondary education (over that of primary education) has not grown as fast as that of the primary education premia and still has not reached the level of 1985. This might be related to the relatively slow growth of formal sector work, which normally employs secondary school graduates.

Figure 24. Evolution of Estimated Premia by Educational Level, 1985 to 1997



Source: World Bank Analysis of Household Survey by Instituto Cuanto, 1985, 1991, 1994, 1997

Although the wage differential between nonuniversity tertiary education graduates and secondary school graduates also recovered by 1997, it was only returning to the level of 1985. Only the university premium exceeded the level of 1985. This signals an increasing demand for a higher level of skills in an open economy that is facing growing

international competition and technological change. This trend is similar to those in many Latin American economies such as Colombia (Cardenas and Gutierrez, 1997), Costa Rica (Gindling and Robbins, 1995), Chile (Robbins, 1996) and Argentina (Pessino, 1995) where returns to education have also increased after structural reforms.

Rising education premia has implications for policy. If education premia continue to increase, many people will have incentives to pursue further education, even in adult or evening classes. As they attain more education they are likely to climb in the earnings scale. This will probably increase their likelihood of not being poor. If repetition and dropout rates fall, people will have higher levels of education attainment, even if their years of schooling remain unchanged. Given the positive relationship between literacy of parents and school attendance of children, there is an intergenerational positive effect on education. This is the start of a virtuous cycle. In the case of workers that do not improve their skills through education and training, they are less likely to improve their income due to their lower productivity.

In rural areas, Escobal, Saavedra, and Torero (1998), using a sample of rural families in household surveys from 1985 to 1996, found a positive relationship between years of education of the household head and of the other family members and per capita household expenditure. Taking the trend to its logical conclusion, an improvement in the quality of basic education will certainly have effects over the skill structure of the labor force and income distribution.

Table 2 shows private and social rates of return to education in 1997 (See Background Note 3 for methodology and explanation). Returns to primary education for men are very high. This is not inconceivable for this educational level. A paper by Psacharopoulous shows the rates of 24 percent and 31 percent for Venezuela and Guatemala, respectively. On the other hand, the large difference between males and females might be attributable to the small number of noneducated males *actually working* in urban areas. That they comprised only 2.3 percent of the sample of males might bias the estimate.

Table 2: Urban Peru: Rates of Return to Public Education, 1997

	Female		Male	
	Private	Social	Private	Social
Primary education	5.9%	5.1%	37.8%	26.3%
Secondary education	10.4%	7.4%	7.2%	6.1%
Non-university higher education	12.1%	10.4%	9.4%	8.2%
University higher education	13.9%	12.4%	12.1%	11.1%

Source: World Bank analysis of Cuanto's 1997 household survey

Private returns to education increased with the level of education for both men and women (except for primary educated males). This is completely consistent with the trends observed in the labor market all over the world. What is peculiar to Peru is the very small difference between private and social returns to various levels of education (Table 2). This corroborates the point made in Chapter 2 about the low level of public spending on education per student at all levels, because the calculation of social returns used public expenditure to estimate the cost. When the costs are low, the returns would be high. Another feature special to Peru is that social returns to university education were higher than those to other levels of education. Again, this supports the point made in Chapter 2 about public spending on university education per student being much lower than that of other countries.

Both the social and private rates of return to all levels of education, except primary, were higher for women than for men (Table 2). This indicates the profitability for public investment in girls and women's education. Given the very low enrollment ratio of females in higher education in the rural area, and among the lower quintiles, the beneficiaries of these high private returns are urban women from upper quintiles. Since rural women are not likely to have access to such opportunities without specific government intervention, provision of scholarship to rural girls who have a good academic record would yield high benefits to society.

Conclusion. The policy implications of these findings are that investment in basic education, both in terms of qualitative improvement and quantitative expansion of secondary education, will have a positive effect on alleviation of poverty, although returns to this level are probably lower because the initial general human capital is low.

The rising private returns to higher education means that children from the upper quintiles who are the dominant consumers of university education, are the main beneficiaries of public investment in this subsector. (See Appendix 4.2a and 4.2b for enrollment in higher education by quintile and Appendices 4.4a, b, c, d, and e for incidence analysis). Although high social rates of return to education justify continuous government investment in this level, the social returns will not remain high if public spending per student in this level keeps on rising. Additional resources needed to improve quality of higher education can come from cost sharing at the university level. Given that students will benefit from a high level of lifetime earnings, it is justifiable to ask them to contribute their fair share to finance their own study. However, increased cost sharing also needs to be supported by student financial assistance such as student loans to ensure that the academically deserving will not be disqualified due to financial constraints.

To ensure gender equity, a proactive policy by the Government is needed to support women, particularly those in the rural areas, with good academic standing to access higher education.

3.3. Learning Outcomes

While repetition, retention, and dropout rates are indirect indicators of quality, the most direct measure of learning outcomes is student achievement. Like other Latin American countries, Peru has only set up measures of student achievement in recent years.[33] Notwithstanding startup problems—which are common to many countries, and which limit interpretation of the initial tests—information on the relative performance of students in the country provides the opportunity for a preliminary diagnosis of determinants of achievement. In addition, it provides a basis for improving the assessment instrument and other technical aspects for policy research in future. (See Background Note 4 for description of the analytical procedures and preliminary findings.)

Table 3 presents the national average Grade 4 mathematics test scores and scores of various subgroups of the 1996 assessment. It should be cautioned that such scores are not meaningful by themselves. Furthermore, validity (measuring what it should measure for students at that grade level) and comparability of the instrument across years have yet to be established. An assessment instrument that is set to be too difficult, even if it is based on the curriculum, can have the effect of making students perform badly; on the contrary, if it is too easy, it can make all students perform well.[34] Also, because the test was not equated with other internationally known studies—such as the Third International Math and Science Studies, whose Population A of 9- and 10-year-olds were quite comparable with the Peruvian Fourth Graders—the test results *cannot* be interpreted as an indicator of how well students performed in comparison with students of other countries.

What is informative for policy analysis purposes is the relative performance of students compared among themselves. Table 3 shows that the achievement gap between private and public schools was large. Among public schools, disparity existed between urban and rural areas. The urban and rural outcome differential should be much bigger than the data show, because children in very small rural schools with only a single teacher were not included in the test, and yet these schools represented about 29 percent of all schools and about 6 percent of the population of Fourth Graders.[35] Students on the coast performed on average better than those in the mountains (sierra), who in turn, fared better than those in the jungle (selva). There was also a gender difference in outcomes, as girls did less well than boys. The lowest score was among Quechua-speaking students. To the extent that the coefficient of variability was large on country average, and much larger

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[33] The first national standardized test of achievement in mathematics and language was conducted in 1996 among nearly 50,000 Fourth Graders in a national sample. Background Note 4 reports the findings of an analysis of determinants of achievement. The assessment program was expand to other grades in 1998 and 2000. However, because the findings from these subsequent exercises were released after the completion of this report, they are beyond the scope of this study.

[34] A good test should have both easy and difficult items for both the average and the exceptional students to score. It should be consistent in its difficulty level from year to year in order to measure progress.

[35] According to the 1993 Census, 29 percent of all schools were single-teacher schools, 33 percent had at least some multigrade classrooms, and 38 percent were complete schools.

among certain subgroups (public rural schools, Quecha-speaking students, and in the jungle areas), variability of learning outcomes is a key issue in education.

Table 3: Fourth Grade Mathematics Outcomes, 1996

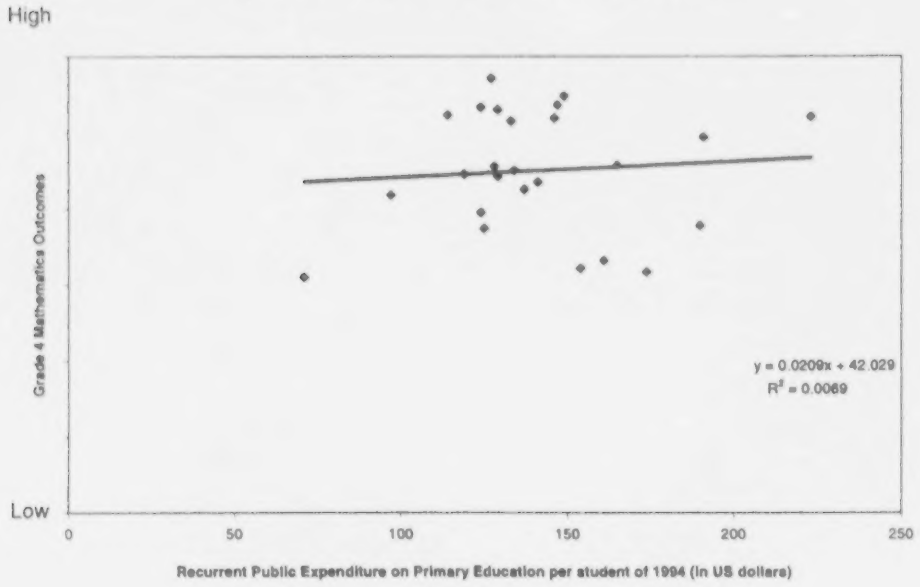
	Average Mathematics Test Scores (Standard Deviation in parenthesis)	Coefficient of Variability
Countrywide average	45.4 (21.5)	0.47
Male	47.1 (21.7)	0.46
Female	43.7 (21.1)	0.48
Public rural	38.7 (21.0)	0.54
Public urban	44.0 (20.2)	0.46
Private	62.4 (21.1)	0.34
Spanish-speakers	47.3 (21.6)	0.46
Quechua-speakers	33.1 (18.0)	0.54
Aymara-speakers	45.0 (20.0)	0.44
Coast	49.9 (21.6)	0.43
Mountain	45.4 (21.4)	0.47
Jungle	37.5 (18.9)	0.50

Source: Ministry of Education.
Note: The coefficient of variability is computed by dividing the value of the standard deviation by the corresponding mean of the group.

To assess the impact of public finance on school achievement, mathematics outcomes by department were regressed on per student public expenditure on primary education by department of 1994. The reason for using 1994 expenditure data to predict learning outcomes in 1996 was because of the time lag between public spending and demonstration of effects on learning. No relationship was found between public spending per student by department and outcomes by department, as the R-square was zero (Figure 25). A weak relationship was also found between poverty by department and per student public expenditure on primary education by department (R-square = 0.06) (Figure 27).

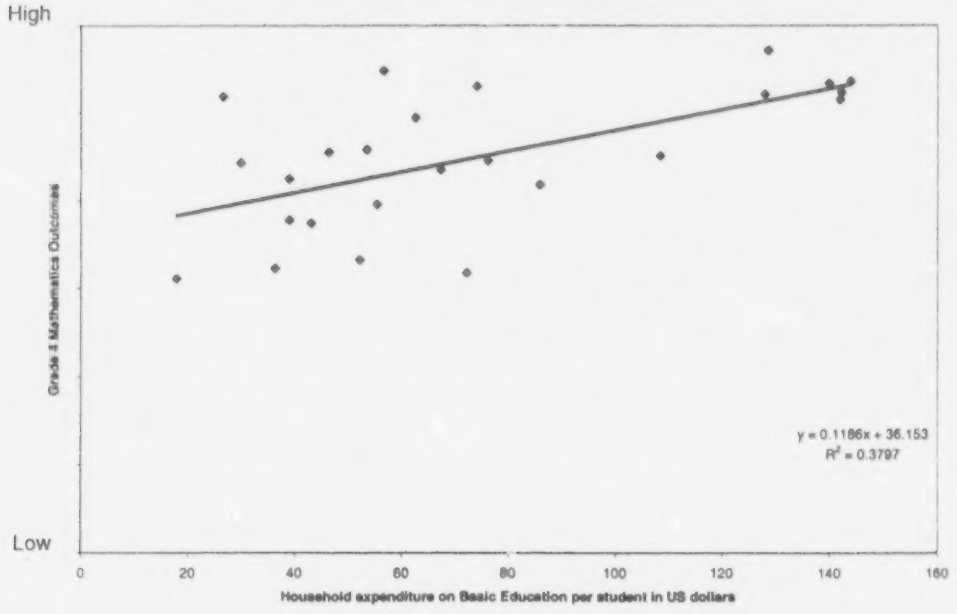
This might be attributable to the formula of allocating teachers: in the rural areas, one teacher is allocated for every 20 students, whereas in the urban areas, one teacher is allocated for every 35 students. Given the high correlation between poverty and rural population as a percentage of total population in the department, it could well be that no relationship was found between poverty and public expenditure per pupil. One should also take into account that the massive increase in public spending on education began only in 1993 through 1995. It is not surprising to see little effect of public spending on outcomes during this short time period because of the natural time lag between delivery of infrastructure, goods, and services (including textbooks) to the schools, and when these facilities and goods are used for teaching and learning.

Figure 25: Mathematics Outcomes and Recurrent Public Expenditure on Basic Education Per Student



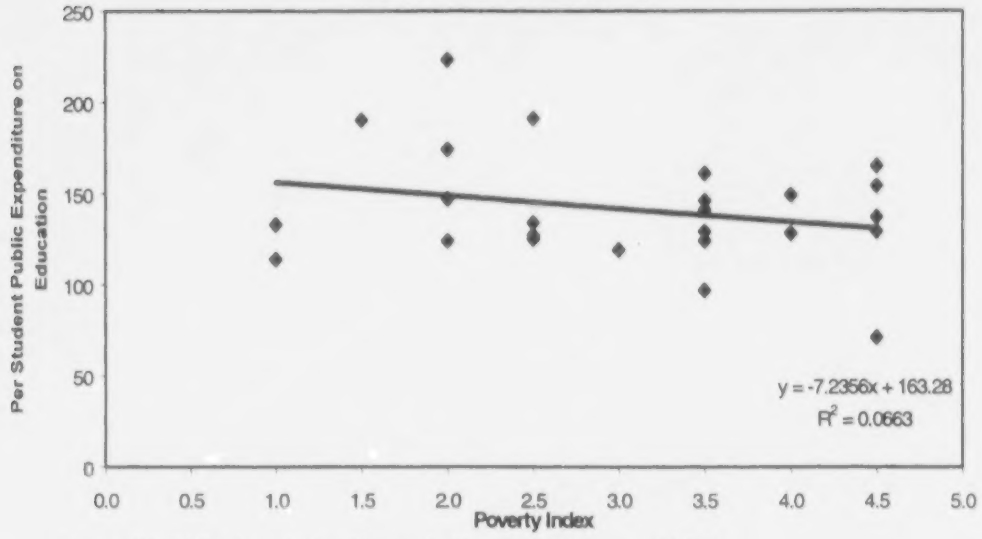
Source: World Bank analysis of data from MEF and MED.

Figure 26: Mathematics Outcomes and Household Expenditure on Basic Education Per Student



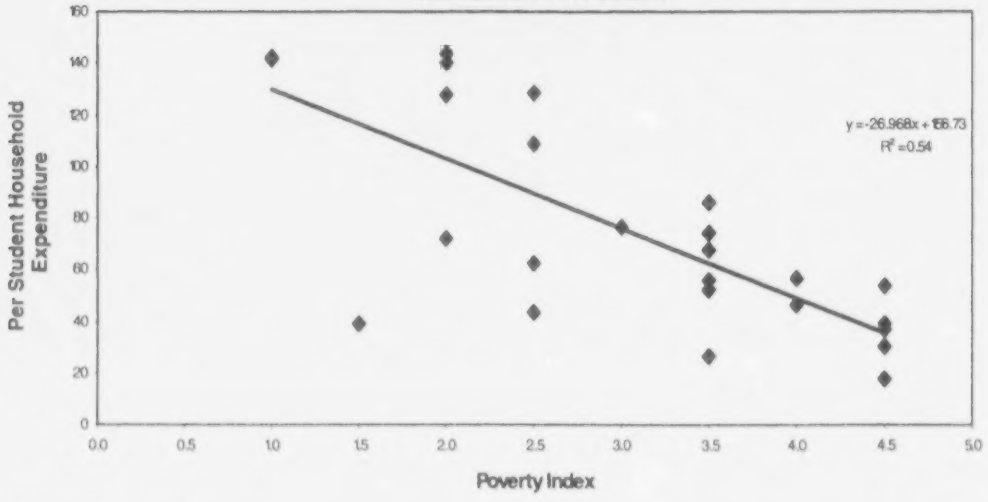
Source: World Bank analysis of data from Cuanto's Household Survey and MED.

Figure 27: Poverty and Recurrent Public Expenditure on Basic Education Per Student



Source: World Bank analysis of Cuanto's Household Survey and MEF.

Figure 28. Poverty and Household Expenditure on Basic Education Per Student



Source: World Bank analysis of data from Cuanto's Household Survey and FONCODES.

To examine the effects of household expenditure on achievement, family spending on basic education per capita in 1994, by department, was used to predict mathematics outcomes in 1996. It should be noted that the level of household spending on education reflected a very long tradition of family support for education, and hence, the level of private spending was likely to represent a continuity of this tradition, rather than an abrupt change as in public spending.

When mathematics outcomes by department were regressed on household spending on basic education per capita by department, a positive relationship was found and the R-square statistic was a strong 0.38 (Figure 26). This indicates that the higher the level of household spending per capita by department, the higher the learning outcomes by department. This raises the question of whether poorer departments were particularly disadvantaged.

To answer this question, poverty index by department was regressed on household spending on basic education per capita by department. A negative relationship was found, meaning that the poorer the department, the lower the departmental average of household spending per capita. The R-square statistic was a strong 0.54 (Figure 28). These reinforce the points made earlier about the *inherent inequality in relying on households to finance basic education* because this merely replicates the socioeconomic inequality in society.

Nonetheless, some departments which had low levels of household spending on basic education had departmental outcomes well above the predicted line (Figure 26). This raises the issue of whether household expenditure by department captures the effects of other variables. To disentangle these issues at the departmental level, the technique of hierarchical linear modeling (HLM) was used. (See Background Note 4 for details.)

It was found that, although the combination of public and private expenditure per capita by department explained nearly half of the between-department variance in outcomes, public and private expenditure did not substitute for each other. Poverty alone had a negative effect on outcomes, but it did not have a linear relationship with them. Dividing departments into nonpoor, average, poor, and extremely poor categories provided a more precise measure of the effects of poverty on achievement. All of the above-mentioned variables, in combination with departmental percentage of female students, students in private schools, Quechua speaking students, and over-aged students, and the proportion of teachers graduated from universities and teachers trained in ISP, explained 94 percent of the variance in test scores between departments.

Student-level variables (namely, age, gender, mother tongue, the availability and usage of textbooks, student attendance and study habits, and parental roles) cumulatively explained 5 percent of the within-school variance in achievement. School-level variables (namely, geographic factors, availability and usage of textbooks and homework assignments, teachers' characteristics, teachers' role, principals' characteristics, and parental role) cumulatively explained 35 percent of the variance in achievement between schools. (See discussion in Background Note 4 for details.)

When department-level variables were taken into consideration, in addition to student- and school-level variables, about 12 percent of the variance in math achievement was attributable to differences in characteristics between departments. Within departments, 43 percent of the variance in test scores was attributable to characteristics between schools. Within schools, 45 percent of the variance was due to characteristics among students. A between-school variance in achievement above 30 percent is normally considered as an indicator of inequity in learning outcomes. (See Appendices 5.1 and 5.2 for international comparison.)

It should be noted that the relative weights of the above-mentioned variables reflected more the imprecision in constructing the explanatory variables in the questionnaires than the lack of predictive power of these variables. The relatively low percentage of variance explained at the student-level also reflected the absence of some crucial predictors in the dataset, such as parental educational level, hours of study at home and home resources (which could be proxied by measurable materials such as type of dwelling and sanitary facilities, ownership of refrigerator or telephone). Even at the school-level, where explanatory power was higher, information was not collected on school-level resources (which could be proxied by material the school was constructed of, type of sanitary facilities, availability of water, electricity, and library, etc.); government allocation per student in the school; household contribution per student; whether the school is on shift; and student and teacher absenteeism. To inform policy for more precise intervention, it is desirable to collect these variables in the future, as well as to revise the questionnaire. Another limitation to be overcome in future is the appropriate sampling of rural schools, including single-teacher schools in the sample.

Due to these limitations, the results obtained from analysis of determinants of learning outcomes should be viewed as suggestive rather than definitive. That said, the findings are encouraging in indicating potential directions where change could make a difference.

Although there are gaps in mathematics outcomes between gender, region, and private and public schools, *after controlling for a number of explanatory variables the picture has changed.* Students in poor and extremely poor departments performed better than those in nonpoor and average departments, holding other variables constant. Some departments were doing a better job in educating over-aged students. Aymara students performed as well as Spanish speakers. Quechua students could perform as well as others if they were not educated in predominantly Quechua schools, thereby indicating that the problem is not with the students themselves. Teachers who have had longer years of service, and teachers who have had more in-service training, were positively associated with higher student achievement nationwide. Nonavailability of textbooks was negatively associated with mathematics achievement nationwide. Parental expectation for better performance in the relevant subject has been translated into higher student performance nationwide.

Table 4 summarizes the findings of cross-level HLM analysis to indicate which explanatory variables have positive or negative effects on math achievement and whether these effects varied across schools and departments.

Table 4: Summary of Effects Crossing between Departments, Schools, and Students

	Statistically significant effects (controlling for other variables)	Effects varied across Department	Effects did not vary across Department	Effects varied across schools	Effects did not vary across schools
Between Department					
Household expenditure per capita	+				
Poor departments	+				
Extremely poor departments	+				
Department % of teachers from ISP	+				
Cross-Level between Schools and Departments					
Female students	-		x		
Over-aged students	-	x			
Quechua students	-	x			
Teachers' years of service	+		x		
Number of training courses attended	+		x		
Cross-Level between Students, Schools, and Department					
Female students	-	x		x	
Over-aged students	-	x		x	
Quechua students	-	x		x	
Parental expectation for the subject being tested	+		x		x
No text materials	-		x		x

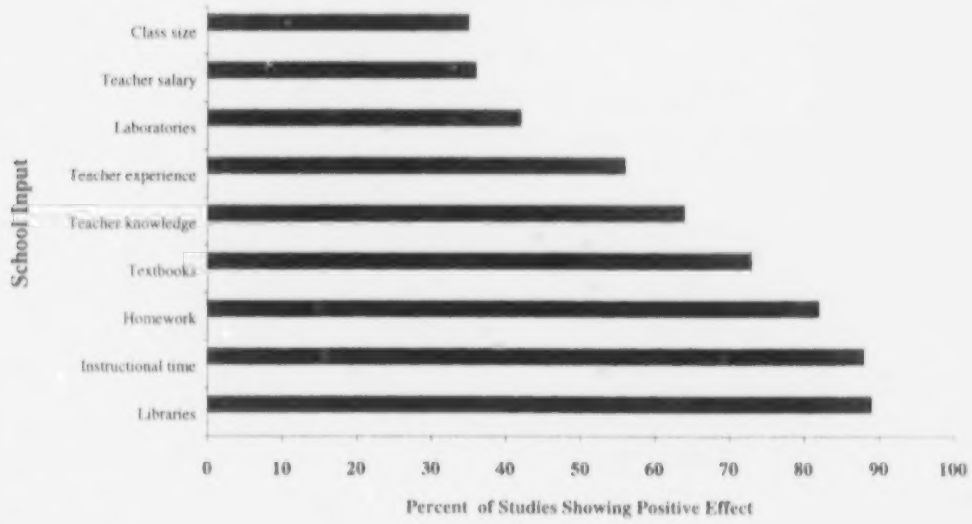
Note: The coefficients of variables that had no statistical significance were not reported.
Source: Background Note 4.

Policy implications. These findings point to the opportunity for public policy to make a real difference for disadvantaged students. The policy interventions should be universal where the effects have nationwide impact (that is little variation at the school and departmental levels). These include textbook provision (by extending beyond the primary level which was provided by MECEP to preschool and secondary level); strengthening teacher pre-service and in-service training; providing incentives for experienced teacher to remain in the profession; deploying qualified and experienced teachers to the rural areas; specific training to teach more effectively to over-aged students; and

using the mass media and parents associations to enhance parents' role in supporting their children's education. Where the effects vary across departments or schools, targeted interventions are desirable. These include specific support for schools where Quechua-speaking (and other indigenous) people are predominant. This might require strengthening bilingual education and text materials. In better schools, special attention might need to be paid to bring girls and over-aged students up to the standards of other students. Finally, it should be remembered that there was no statistically significant difference in performance between Spanish speakers and Aymara speakers. Future research should find out what factors have enabled the latter to overcome the barriers facing speakers of this indigenous language.

These findings were consistent with those from the literature about the effectiveness of several commonly used policy instruments to improve learning outcomes. These instruments include provision of instructional materials and facilities (such as textbooks, libraries, and laboratories); increasing the opportunity to learn through increasing instructional time and homework; provision of teacher training; increasing teachers' salaries; and reducing class size. Figure 29 summarizes the findings from the literature review.[36]

Figure 29. Determinants of Effective Learning in Primary Education: Findings from Literature Review



Source: Reproduced from World Bank, 1996, based on literature review by Fuller and Clarke.

[36] World Bank, 1995; Lockheed and Verspoor, 1991; Harbison and Hanushek, 1992; Postlethwaite and Ross, 1992; Warwick, Reimers, and McGinn, 1989; Tatoo et al., 1990; Fuller and Clarke, 1994.

It should be noted that *the effectiveness of these instruments depends on specific country context* and that some measures are administratively simpler to implement (such as provision of a library, or textbooks) than others (such as improving teachers' knowledge). Therefore the graph should not be interpreted as a hierarchy of effective interventions, but rather it should be viewed as an indicator of degree of easiness for implementation. Providing school libraries is found to be cost-effective in nearly 90 percent of the studies, and increasing instructional time (such as lengthening the school day or providing additional instruction in a certain subject) almost equally effective. Asking students to do homework comes third, and provision of textbooks to children who do not have them comes fourth. Improving teachers' knowledge through training is found to be effective in the majority of cases, and having experienced teachers also comes close. Provision of laboratories, increasing teacher salaries, and reducing class size are also effective, but in fewer cases, most probably because they are more difficult to implement.

A more recent review by Schiefelbein, Wolff, and Schiefelbein (1999) on cost-effectiveness of primary education policy in Latin American found six interventions with highest estimated impact on target population if fully implemented. These are: (i) adopting multiple interventions of learning packages, school-based management, training, and testing; (ii) assigning best teachers to the first grade; (iii) decentralizing with supervision; (iv) paying rural teachers 50 percent more; (v) providing standard textbooks and training teachers; (vi) using developmentally oriented preschooling.

Policymakers are well advised to evaluate which interventions are relevant for their country's conditions and to assess the feasibility of implementation and the recurrent cost implications.

Conclusion. This chapter aims to address the question of whether expansion of education in the past has come at the expense of quality. A review of indicators on educational access, internal efficiency, and quality has found that there has been a tradeoff between access and quality as resources have been spread thinly to meet multiple demands. In light of rising premia for education, which signal a growing demand for higher skill levels in an increasingly competitive environment, the serious implications for the employment prospects and future lifetime earnings of disadvantaged groups cannot be ignored. This calls for a focus on quality improvement particularly for disadvantaged groups as a centerpiece for education policy.

Chapter 4. The Teaching Profession

The fourth question asks whether the ability to contain personnel cost in public expenditure on education has contributed to Peru's ability to extend educational access and how this and other policies toward teachers might affect the sector. Since education is a labor intensive enterprise because interaction between students and teachers is critical to learning, sound policy toward teachers that can enhance student learning will improve efficiency of resource use. The findings in the analysis of determinants of math achievement in Grade 4 in Peru affirmed the positive impact of teacher qualification, experience, and professional development on achievement nationwide. Research evidence from the United States also found that skilled teachers are the most critical of all schooling inputs (in an environment where the needs for textbooks, instructional materials, and facilities have been met).[37] These findings underscore that focusing on teachers and teaching is the only way in which an education reform can make an impact in the classroom and help improve student achievement. This chapter reviews the issues related to the teaching profession with the aim of identifying options for improvement.

4.1. Teacher Qualifications and Employment Status

Qualifications and deployment. In the Peruvian public education system, there are some 248,000 primary and secondary school teachers (Appendix 2). About 62 percent of these are qualified with titles (*con títulos*), that is, they have a diploma in pedagogy from one of the 318 tertiary-level teacher training institutes (Instituto Superior Pedagógico or ISP for short) or from one of the 38 education faculties of a university. The rest (38 percent) are unqualified (*sin títulos*), that is, they do not have pedagogical titles. They either did not fully satisfy all requirements for the pedagogic diplomas, have other tertiary-level diplomas, or have only completed secondary education. Teachers without titles have lower pay and lower status than those with titles in the profession (Appendix 6.19).

There are no statistical breakdowns of the academic qualifications of teachers without titles by level of education. The only information comes from the sample survey of teachers that accompanied the 1996 national assessment. Among teachers of Grade 4 students in the sample, 15 percent graduated from university pedagogical programs, 51 percent graduated from ISPs; 1 percent graduated from Institutos Superiores Técnicos (IST); 6 percent held university bachelor's degrees, 17 percent obtained their teaching qualifications through part-time professional studies; 1 percent graduated from other programs; 6 percent had only secondary education plus teacher training; and 3 percent had only secondary education without any training (see Table 2 in Background Note 4).

Having the required pedagogical qualifications is not synonymous with being a good teacher. In fact, ISPs are alleged to be academically weak and also to attract poorly

[37] According to Ferguson (1991), in the United States, 49 percent of learning outcomes is attributable to home and family factors (such as parental education, income, language background, ethnicity, and location), whereas 43 percent is attributable to teacher qualifications and experience, and only 8 percent to class size.

prepared students. However, since teachers without titles have lower pay and lower status in the profession, those who remain in the profession signal that they have even lower opportunity cost than the trained teachers. Furthermore, the analysis of the 1996 test confirmed that teachers who were graduates from university and ISPs were associated with higher student achievement than those who were not graduates from these programs.

Although the number of teachers with titles seems low, this already represents a dramatic improvement even from the early 1990s. According to the 1993 census, only 52 percent of teachers in service had titles while 48 percent did not. By 1995, teachers without titles declined to 42 percent. By 1997, they were reduced to 38 percent.[38] At present, to be appointed to an authorized pensionable position, one has to have a title and have passed a nationally competitive examination. The rapid growth in the supply of teachers with titles is due to a dramatic increase in teacher training institutions, particularly the private ones. Background Note 5 discusses the implications of the rapid growth of teacher training institutions and the issues of teacher training.

While progress has been made in the supply of teachers with titles, the key question is whether there is a particular pattern in the deployment of teachers without titles and its potential impact on quality of education. According to the 1993 census, the vast majority (68 percent) of the unqualified teachers taught in the rural areas. The MED's 1994 survey of rural and urban public schools in Lima and Cusco found a positive relationship between school size and the percentage of teachers with titles. In large and very large urban schools, as well as large rural schools, over 81 percent of teachers had titles. In medium-sized urban schools, teachers with titles dropped to 73 percent, while in small rural schools, they declined further to 50 percent. The percentage of teachers trained in regular programs (that is, in ISPs and the education faculties of universities) varied from a high of 85 percent in large and very large urban schools, to 64 percent in small urban schools, to 53 percent in small rural schools (Appendix 4.6).

The same pattern is also observed among principals of schools. For example, over 92 percent of principals in very large and large urban schools, as well as in large rural schools, had titles, compared with only 74 percent in small rural schools. Over 86 percent of principals in these large urban and rural schools were trained in regular programs, in contrast to only 72 percent in small rural schools. (Appendix 4.6.)

These patterns show that teachers who have the required qualifications are reluctant to take up hardship positions in remote rural areas. They still go to large rural schools which are located within reasonable distance from an urban area, and which tend to have better school resources, and easier access to health and other social services for the teacher and his or her family.[39] The same is not true for small rural communities, where the poor working conditions, the lack of opportunities for additional part-time employ-

[38] In the Inka Region, for example, unqualified teachers accounted for almost 60 percent of the teaching force in 1990, but now account for only 32 percent.

[39] See the companion Health Sector Study by the World Bank for the inadequate and low quality rural health service (World Bank, 1999b).

ment or work for the teacher's spouse, and inaccessibility to various social services make it hard to attract teachers with titles.

The findings of the 1994 survey of rural and urban schools illustrate just how large a disparity in working conditions exists between urban and rural schools. For example, electricity was available to over 97 percent of large urban schools, 89 percent of medium-sized urban schools, and 55 percent of small urban schools, in contrast to only 29 percent of small rural schools. All teachers of Second Grade who were surveyed in very large urban schools had textbooks, compared to only 91 percent of teachers in small rural schools. The number of visits by an inspector from a USE, no more than 1.5 times per year at best, was twice as frequent in urban schools than in rural schools, reflecting both the difficulty of access as well as marginalization of rural schools. The average number of training courses attended by teachers was much higher for those in urban schools than rural schools (see Appendix 4.6). And yet, there was insignificant earnings differential between teachers who worked in difficult rural conditions and those who taught in urban areas. (See Appendix 6.19.)

That is why the turnover rate of rural teachers is much higher than that of urban teachers. For example, the average year of teaching in the schools surveyed was much shorter (2.3 to 3.6) for teachers in small and medium-sized rural schools than for teachers in very large urban schools (5.9), although their average ages were within a narrow range of 32 to 36. For school principals, taking up postings in smaller schools appeared to be a channel for career advancement. The average age of principals in large urban and rural schools was between 45 and 48, but that of principals in small and medium sized rural schools was between 36 and 39. (Appendix 4.6.)

Policy to address the inequity in learning outcomes cannot avoid tackling the issue of *deployment of trained teachers to rural areas*. This entails providing a larger rural allowance tied to positions in rural schools, and using job rotation every three years to attract teachers with titles to take up positing in remote communities because it will not be a permanent assignment. Meanwhile, public investments should be made in rural schools to improve school resources and working conditions, as well as to enable rural teachers to break their isolation and maintain professional contact with other teachers within a cluster of schools. Teachers who are going to teach in rural schools should be given additional training on how to handle multigrade teaching. Concomitantly, since many remote areas are populated by indigenous people, it makes sense both in terms of promoting multiculturalism and bilingualism to recruit indigenous teachers for schools in their communities. Given the association of indigenous teachers (except the Aymara) with low achievement of students, this indicates indigenous teachers should be given additional pre-service and in-service training in order to prepare them better for the task.

Employment status. Teachers are classified either as permanent staff who are appointed to authorized pensionable positions (APP) (knows as *nombrados*), or on contract (known as *contratados*). Contracted teachers are not eligible for pensions, and can be dismissed without severance pay. There is no relationship between teachers' qualification and employment status.

APPs are the main means of allocating public education budgets to lower levels of educational authorities. Theoretically, APPs were distributed to each Regional Directorate of Education on the basis of enrollments in each school (one APP for 35 students in the urban areas and 20 students in the rural areas), and incremental APPs are supposed to be allocated annually on the basis of the changes in enrollment. But the organic APPs have not been reviewed for a long time, and the number of annually adjustable APPs has been fixed since 1995. Therefore, no systematic relationships seem to exist between the number of APPs and enrollment, and the budget allocation system has lost its rationale. Since one APP can be used to hire more than one teacher by converting them into contract or part-time positions,[40] there are no precise statistics as to how many teachers are in the system or how many are permanent or on contract. When a Regional Directorate of Education asks for additional APPs on the basis of incremental enrollments in one school, the MED has no information at hand on the possibility of redistributing the APPs in the same region or in its USEs, taking into account the APPs in nearby schools.

The organic APPs are supposed to be filled by appointed teachers through the competitive selection examination, and the annually adjustable APPs by contracted teachers. But when fewer candidates than positions are selected, the organic positions are filled by contracted teachers as well.[41]

More than half of the contract teachers are estimated to have titles because most of them are recent graduates from ISPs. Of the 93,000 unqualified teachers nationwide, some 80 percent are estimated to be appointed teachers. In other words, it is possible that there is a higher percentage of unqualified teachers in permanent positions than those on contract, although in absolute numbers, they are minorities among permanent staff. The nonexistence of a relationship between qualification and employment status is largely due to historical school expansion and demand for teachers. This is probably a major reason why the determinant of achievement study using the 1996 test data did not find any association between teachers' employment status and student achievement, but it did find a statistically significant positive relationship between teacher qualification and student achievement.

The deployment of appointed and contracted teachers does not display a clear pattern because political considerations also may enter into the decision. For example, in the frontier areas, teachers in remote rural schools are often made permanent staff irrespective of their qualifications. Their job security, status, and satisfaction are considered vital to national security. In remote internal areas, the pattern appears to hold as well. For ex-

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[40] Nationally selected teachers are appointed by the DRE for a specific school on the basis of teachers' preference, scores, and prior teaching experience. Therefore, there is no room for a school principal or a USE director to select the candidates. (However, a principal can hire contracted teachers with the DRE's approval.)

[41] In the case of the Cusco Subregion in 1997, a total of 13,674 organizational APPs was budgeted. However, at the end of the year, only 12,320 teachers were appointed and the balance was contracted. In addition, 158 teachers were contracted as provided by the budget for annual incremental APPs, which has been fixed since 1995.

ample, the analysis of the 1994 survey of rural and urban schools in Lima and Cusco found that among teachers in small rural schools, 90 percent are permanent staff, even though only 50 percent of them have titles and their average age is about the same as those in large urban and rural schools. By contrast, only 84 percent of teachers in very large and large urban schools are permanent, reflecting largely the fact that 81 percent of them have titles. (Appendix 4.6.)

In the old system, appointed teachers enjoyed generous benefits and life-long tenure (see Footnote 6 in Chapter 1 for the various laws that have regulated pensions). However, the pension benefits are rapidly eroded for new entrants. The new individualized private pension system would enable even contracted teachers to contribute to their retirement benefits. At the same time, the institution of performance review in the public sector may soon erode the job security of appointed teachers as well. Nonetheless, appointed teachers would be entitled to severance pay while contracted teachers will not. Given the rapid erosion of job security even for appointed teachers, the major difference between these two types of teacher may be the status conferred. This difference, however, could have a very negative impact on the *morale and commitment* of contracted teachers. Therefore, it is important for policy to address the issue of *incentives* for higher performance. An option is to convert everyone into an open-ended contract with personalized pension plan. This could eliminate the two-tier system and allow performance to determine duration of tenure.[42] This may require a Congressional decision to change the law.

4.2. Conditions of Service and Compensation

The differences are minimal in the conditions of service and compensation of appointed and contracted teachers; they are also minimal between primary and secondary school teachers, and between teachers with titles and teachers who have academic degrees in other professions or postgraduate degrees. This indicates a lack of incentives in the system to encourage commitment, professional development, and higher performance, which could translate into better student achievement.

Conditions of service. Both appointed and contracted teachers are obligated to work for 40, 30, or 24 hours per week, but that distinction is largely artificial. Most teachers work about the same number of hours whether they were appointed to do it or not. The difference in pay between 40, 30, and 24 hours of weekly work is also minimal. There is also no difference between appointed and contracted teachers in working hours. The majority of initial and primary education teachers are appointed for 30 hours, and secondary teachers for either 30 or 40 hours. There is no difference in pay between primary and secondary school teachers even though the latter are expected to have higher knowledge of subject content. Principals, deputy principals of all schools, and senior teachers at secondary schools are appointed for 40 hours a week. Teachers have the right to ask for reassignment to a different school in a different location after three years of

[42] This is the option chosen by the World Bank for its staff in 1998 in order to address the inequity of the two-tier system of having pensionable staff and consultants doing the same job but with different compensation.

service, but in reality, it is hard to get reassignment, leading to a lot of dissatisfaction among teachers.

Teachers' working conditions have not changed much over time. They usually have two months of vacation in the summer (January and February) and one week vacation in the winter. In remote rural areas, teachers do come to the town to collect their pay checks if they do not have a bank account and to take in-service training.[43] On those occasions, they often take off a few days informally. Absenteeism is therefore often higher in rural and public schools than in urban and private schools. The academic year starts on April 1 and ends on December 15, but the net instructional period is often less than 180 days, as in many countries in Latin America, which is on the low side of the international range. There is also no difference in remuneration between appointed and contracted teachers.

Remuneration.[44] There is only one national salary scale for all regions and departments (Appendix 6.19). Teachers under different pension schemes (governed by Laws 20530, 19990, and individualized accounts) have different salary structures. Those under Law 20530, who enjoy the most generous pension benefits, have lower salaries, whereas those under the individualized pension scheme have the highest salaries. The basic salaries are adjusted for marital status (unmarried or married with up to 5 family members), rural allowance (s/45 per month, which has not changed since 1993), and three fixed bonuses (s/300 each in March, July, and December). The average salary for those under Law 20530 is 627 soles per month, those under Law 19990 receive 646 soles, and those under the individualized pension plan receive 689 soles. Rural allowance, however, is portable; that is, even after teachers leave the rural position and teach in the city, they will still be able to keep the monthly rural allowance permanently. This practice should be discontinued. Reform in salary scale should raise the rural allowance, but link it to the position and not to the person.

There are five scales of salaries (I to V) for promotion. However, the difference between scales is insignificant (only some s/.12 per month). There is only a 10 percent difference in remuneration between the top grade for 40 hours work and the lowest grade for the same amount of work (Appendix 6.19). Promotion between scales has been frozen since 1991. Consequently, the majority of teachers are at levels I and II, and do not have strong motivation for better performance, professional development, and promotion. Ap-

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[43] To give an example, in Loreto Department, a teacher who has to work in a remote community near the frontier with Ecuador has to travel 20 days upstream by boat from Iquitos to his/her posting and about the same number of days downstream to Iquitos. He/she usually has a few months' advance salary, and picks up his/her pay check in Iquitos three times a year. This means 120 travel days every year. During the teachers' travel to Iquitos, students would not have classes. Even though some of the travel time coincides with vacation days, a significant amount of time is lost. This again accounts for why the learning outcomes of rural children are lower than that of urban students.

[44] Teachers' salaries have been increased by about 16 percent on average since April 1999. However, this report only refers to the salary scale prior to April 1999 because the latest information was made available too late to include in the analysis.

pointed teachers receive their salaries through a bank account, and contracted teachers by checks issued to them.

The salaries for teachers without titles have also five scales (A to E) depending on their qualifications, but the difference among scales is more insignificant than among teachers with titles (Appendix 6.19). A is for those who completed pedagogic studies but have not earned the title yet. B is for those who have completed higher education studies with professional titles in other than pedagogy. C is for those who have not completed pedagogic studies at higher education level. D is for those who have studied at higher education level without any university titles. Finally, E is for those who have only secondary level education. The salary differential between a teacher without title who works for 40 hours and is in A scale and his/her counterpart in E scale is only 39 soles per month.

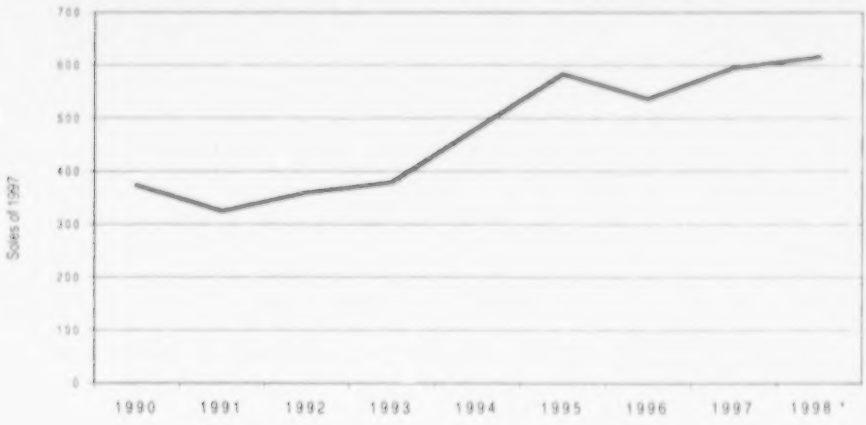
The salary differential between teachers with titles and those without is more substantial, ranging from 80 soles to 170 soles per month. However, the emphasis on pedagogical titles at the expense of downgrading those who have other higher education degrees (scale B) discourages talent from other fields from entering teaching.

There are no statistics on the qualifications, conditions of service, and remuneration of private school teachers. Given the uneven conditions and quality of private schools, it is likely that teachers' salaries also vary a lot. Those private schools that serve the poor are most likely to pay teachers on an hourly basis (about 5 to 7 soles per hour), and teachers probably have to have two jobs at the same time in order to make ends meet. However, according to the preliminary results of a 1997 survey of 1,000 private and public school teachers, salaries in the top private schools may be as high as 4,000 soles per month (Saavedra and Díaz, 1999).

Teachers' average monthly salary of 646–689 soles is more than twice the minimum wage. This amounts to an average annual salary of about US$2,903-3097, or 1.5-1.6 times the GDP per capita, which is lower than the 2 to 4 times prevalent in other countries at a similar level of development. *This is one of the reasons why Peru has been able to provide such broad education coverage at such a low level of public expenditure.*

Teachers' salaries took a hard hit in the 1980s, but their remuneration in real terms steadily recovered in the 1990s (Figure 30). The key policy questions are not whether salaries were high or low relative to other countries, or whether the purchasing power has recovered, but (i) how teachers' salaries fare relative to other professionals who have similar years of tertiary education, which would impact on the ability of the sector to attract and retain academically capable individuals; (ii) whether the salary structure provides incentives for teachers to take up hardship posts in rural areas, to continue to develop their professional skills, and to improve student learning; and (iii) what the recurrent cost implications for restructuring the salary scale are.

Figure 30. Remuneration of Teachers in Real Terms, 1990 to 1997



* With data up to April 1998
Source: Ministry of Education

Saavedra and Díaz (1999)[45] found that teachers' relative position eroded by 30 percent between 1986 and 1992, but other professionals' relative earnings declined by 16 percent between 1992 and 1996, so that for the whole decade 1986 to 1996 teachers' earnings deteriorated by 10 percent in comparison with other professionals. This salary differential between teaching and other professions could induce the best and most adaptable teachers to leave the profession to take up jobs in other sectors. The data compiled by INEI show that real salaries of all sectors declined sharply between 1970 and 1990, but made some recovery in the 1990s. Average teacher salaries lost more than the private sector as a whole, but fared much better than the administrative staff of the public sector in general and nurses.[46] This has not even taken into consideration the two months' vacation enjoyed by teachers, which is not available to other employees in public or private sectors. In summary, although teachers salaries lost markedly their real purchasing power in the 1980s in comparison with the private sector, they gradually recovered after 1990 and fared better than the public sector as a whole. Nonetheless, better salaries in the pri-

[45] Saavedra and Díaz compared the earnings of teachers and other professionals with university-level education, using panel data from the household surveys done in 1986, 1992, and 1996. The work is in draft.

[46] The current mission's findings partly modify the conclusion of Psacharopoulos's 1996 study using household survey data during the 1980s; that is, that teachers are not underpaid in comparison with all other occupations. In fact, teachers are underpaid in comparison with the private sector workers, but not with the public sector workers. The current mission findings also modify the conclusion of the November 1994 Staff Appraisal Report on the Primary Education Quality Project, which states that teachers have suffered the worst fall in income among all categories of government employees. In fact, teachers were better off among all government employees in terms of falls in remuneration.

vate sector could induce migration of the more competent teachers to other sectors. (Figures 31-34.)

Figure 31. Index of Remuneration of Government Employees, 1970-1997. Base August 1990=100

Figure 32. Index of Private Sector Salaries in Metropolitan Lima, 1970-1997. Base August 1990=100

Figure 33. Index of Purchasing Power of Private Sector Salaries 1972, 1990, 1997

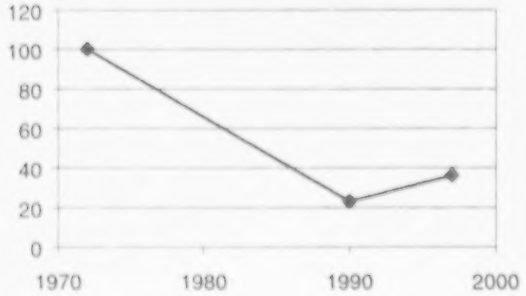
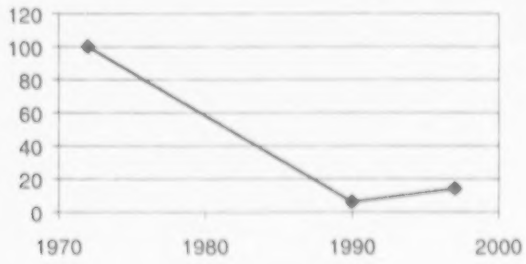


Figure 34. Index of Purchasing Power of Public Sector Salaries 1972, 1990, 1997



Figures 31-34 Source: INEI

The unattractiveness of teaching is particularly serious for secondary education, where growth is expected to occur. The lack of salary differentials between primary and secondary school teachers does not reward knowledge of subject matter, which is more intense in secondary education than primary education. Furthermore, the current salary scale that rewards teachers with pedagogical titles more than those with other degrees (such as in arts and science or with postgraduate training) would not attract talent from other fields into the profession. In the short run, reforming teachers' salary scales to make remuneration to teachers with bachelor or masters degrees in nonpedagogical fields on a par with those with pedagogical titles will be the first step to widen the pool of talent in teaching. This will, of course, have implications for the type of training provided by ISPs, and the basic requirements for teaching. In the long run, the option should be considered of requiring all secondary school teachers teaching above Grade 7 to have the first degree in a subject area, and have additional pedagogical training. The salaries of these teachers would reflect this better academic preparation.

4.3. Incentives and Accountability

Many countries in the world, including OECD countries and in Latin America,[47] are pursuing education reform in order to meet the challenges of global economic integration and technological changes of the 21st century. What distinguishes reform of the 1990s from those in previous decades is the focus on learning outcomes. In varying degrees and at different paces, reforming countries are embracing a set of principles to overhaul their education systems. These are the needs to set standards for student learning, to set standards for teaching, to improve teacher education and professional development, to provide incentives for teacher knowledge and skill upgrading, and to encourage schools to organize for learning. The broad scope of the changes entailed makes this wave of reform one of the most ambitious in the history of education.

In Peru, MED is in the process of building up a meritocratic-based education sector with some of the elements for accountability being set in place. For example, the first national assessment test was implemented in 1996 (Background Note 4); a plan to modernize teacher pre-service and in-service training in primary education was also piloted in 1996 (Background Note 5); and a national competitive examination was introduced to select teachers for appointed teacher positions in 1997. The examination has the dual purposes of selection and quality assurance. Its setup was timely, given the rapid growth of private ISPs, and the diverse curricula offered by ISPs and the education faculty of universities.

In the first administration of the exam, some 96,000 qualified teachers applied for the 34,000 appointed teacher positions, but only 12,000 candidates or 12.5 percent passed the exam. The results of the second examination are very similar to the first one. Since the examination is not a criterion reference test and the validity of the test has yet to be established, it is premature to judge whether the low pass rate reflects poor preparation of teachers or an administrative decision. To truly test the skills of teachers, there is room for modification.

While Peru is heading in the right direction to pursue a systemic reform, it is necessary to ensure that a few key building blocks are in place.[48] Specifically, what needs to be done is as follows:

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[47] In the 1990s, Latin American countries have devoted considerable financial and human resources to reform the education sector. However, the recent experience of implementation of educational reforms throughout the region suggests that these programs have not been able to transform substantially and extensively the behaviors of teachers, the main actors, in the school level where it matters most. The Second Summit of the Americas held in Santiago, Chile, in 1998 outlined a Plan of Action committing all countries of the hemisphere to new reform efforts, including an increase in the level of professionalism among teachers that combines pre-service and in-service training, and the development of incentive mechanisms tied to updating their skills.

[48] In the United States, 5 years of work has gone into improving the instruments that are making it possible today to pay teachers for what they know and do.

- **Establishing overall goals and standards for students, and assessment of outcomes.** As a first step, the education system has to have a clear set of goals spelled out in detail about what it expects students to know and be able to do. Standards are not the same as curriculum because the latter is usually very content- and topic-specific. Standards are more about skills and competency that could be developed in the course of learning various subjects. Without standards for students, it is impossible to set standards for teachers or to measure whether the goals have been achieved. To be able to measure outcomes, an assessment system must be in place, and test validity and reliability must be secured. The results of the assessment should be fed back not only to policymakers, but also to various levels of administrators, teachers, and parents so that they have a clear sense about their school's relative performance, and can gauge their value-added efforts. Peru might want to start with standard setting and provide the results of the 1996 assessment at least to Regional Education Directorates.

- **Setting standards for teachers.** It is important to spell out the content teachers need to know, and the specific kinds of skills and behaviors that constitute good teaching need to be spelled out in meaningful detail. This means providing written documents on what excellence in teaching in a given subject and in a given level (such as science teaching in primary education) would be. Teachers would be assessed against these standards. This might be the next step for MED.

- **Aligning pre-service and in-service training programs with these standards.** Virtually no country in the world has been able to do this yet. However, steady progress has been made. The development of meaningful teacher standards (such as PRAXIS and INTASC in the United States) is beginning to make an impact. Peru can shorten its development time by building on these materials, and by adding what is relevant for their conditions.

- **Making teacher assessments.** Often, this begins with the use of paper and pencil examinations to test teachers' knowledge of subject content, or for certification of teachers. This process has begun in Peru. However, even with the most carefully designed test items, this form of examination alone is inadequate to assess a broad range of skills (such as classroom management, pedagogical repertoire, and team work with other teachers) needed in order to be an effective teacher. New innovative instruments being experimented with in OECD countries include peer examinations of a portfolio of the teacher's work, videotapes of his/her teaching, interviews, competency tests, and other means to ensure a truly comprehensive assessment of a teacher's demonstrated competence as well as knowledge base. Such assessment is predictably expensive, but probably will be cost-effective in the long run when it can positively affect student learning. Assessment techniques are the vehicle to measure progress and inform any corrections which should be made by the teacher and/or system. In future, Peru may want to start by modifying the methods of recruiting teachers to fill APPs by requiring candidates who perform well in the competency test to demonstrate classroom teaching to determine suitability for teaching. Similarly, the recruitment of

principals should be made beyond a paper-and-pencil test by having candidates visit schools and recommend plans for school improvement.[49]

- **Rewarding teachers' knowledge and skills individually and schools collectively.** How the incentive in the system is structured affects behaviors of teachers. Teachers should be rewarded for what they know and do—as measured by objective and multi-faceted performance assessments—rather than for how long they have been in service. Promotion from one level to the next should be based on demonstrated higher level of competency, not seniority. This could provide incentives for teachers to invest in their professional development, which is not necessarily restricted to in-service training, but could include doing more reading at home, more reflection on their practice, or networking with other teachers to keep abreast of the latest developments in the profession. The results to be measured need not be restricted to student achievement, either, but could be extended to broader student intellectual, artistic, athletic, and moral development, and parent involvement. Whatever it is, it must be measurable, preferably in a value-added way. This is not easy, and that is why, despite the desirability of including more diverse measures, most school reward systems in countries that implement them are basically driven by student achievement tests. At the same time, there should be *rewards to schools collectively in order to encourage collaboration among teachers*. Rewarding schools may not require more than one to two percent of the total education budget. This should be combined with public recognition of excellence. The amount should motivate teachers at the margin, but not be so central that teachers will focus their work exclusively on "the test" or whatever else is being measured.[50]

Building professionalism among teachers could be the center piece of reform, and standards should drive the change in each stage of professional development. The best way to build teacher professionalism is through the work of groups of teachers reflecting on what constitutes excellence in the practice of teaching. Since some countries have pioneered the work, Peru can benefit from their experience without having to reinvent the wheel. It should be acknowledged, however, that this requires changing institutions and culture and will be the most difficult task to accomplish.

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[49] In New York City's District Two, which has attained national fame for being able to improve overall student achievement and reduce the variability of learning outcomes of an entire cohort, candidates for principal positions are asked to visit a school or watch a video tape of a school and then tell the hiring committee what problems they have identified and what solution they would propose. This would ensure that the principals selected have practical experience of running a school and of providing instructional leadership.

[50] Colombia has introduced an innovative incentive system to reward and recognize good teaching. Students and parents in every school are asked to elect their best teacher based on a set of criteria provided by the Ministry of Education, while every municipality will elect the best schools, again based on provided criteria. Then the departments will elect the best schools from the list, based on the relative positions of the schools selected by the lower levels. The criteria focuses on efforts, rather than existing conditions. Then there are awards for the best schools in the nation, the best schools in the departments and municipalities, and the best teachers. Both teachers and schools would receive public recognition and a cash award.

Summary. The answer to the fourth research question is affirmative. However, this introduces a policy dilemma towards teachers. Because of the enormous recurrent cost financing implications, education ministries in the world are often constrained by what they can do about salaries across the board, particularly in view of the consensus on working to extend access to basic education. Yet it is important to provide incentives to attract and retain competent people in the profession because teachers are critical to qualitative improvement, as well as quantitative expansion of the system. The issues that need to be addressed in Peru are (i) the disparity in qualifications between rural and urban teachers; (ii) the lack of reward for subject matter knowledge, particularly in secondary school teaching, and the disincentive in the salary scale and promotion criteria for those who have had university and postgraduate education in fields other than pedagogy to enter and remain in the teaching profession; (iii) the morale problem related to different statuses of employment between appointed and contracted teachers; and (iv) the lack of incentives for higher performance.

The first issue calls for increasing the salary differential between rural and urban teachers to compensate the rural teachers for hardship positions, combined with a job rotation system so that they have an opportunity to return after a few years, with investment in rural school inputs to make teaching there more attractive, and with recruitment of indigenous teachers into teaching in their communities. The recent literature review on cost effective interventions in primary education in Latin America by Schiefelbein, Wolff, and Schiefelbein (1999) found that 50 percent increase in salaries of rural teadchers was associated with an increase in test scores by 19 percent. The second issue calls for (a) in the short run making the salary scale of teachers who teach in secondary education higher than those who teach in primary schools, and also raising the salaries of teachers who have university degrees in other subject areas at least to a par with teachers with pedagogical titles so that they do not have a second-class status as teachers without titles; and (b) in the long run changing the academic requirement for secondary school teachers with stronger emphasis on subject matter knowledge. The third issue calls for unifying a two-tier employment status. The fourth issue really requires the support of a systemic reform geared to establishing an accountability system that rewards group and individual performance, preferably based on value-added efforts. This last will be a long-term endeavor and can only be done when the assessment tools are perfected and a culture of evaluation is accepted.

Chapter 5. Second-Generation Reform

This report began by posing a puzzle as a guide to its inquiry of why Peru has been able to have high education participation rates with a relatively low level of public spending on education. After reviewing the issues in the sector, the report found that progress made in Peruvian education is attributable to relatively equitable public expenditure that focuses on basic education; the ability to contain salary cost in the sector; and high value attached to education by Peruvian households and their high level of spending on education. However, expanding access under extreme resource constraints has come at the expense of quality.

The large gap in school survival rates between the rich and poor, and the rural and urban population; the large between-school variance in student achievement; and the rising returns to higher levels of education signal that further policy changes can make a real difference, particularly to disadvantaged students. These changes may be loosely considered to be the second wave of reform because they will build on the foundation laid by the first-generation reform that rationalized the public sector, balanced the budget, and mobilized private resources. These changes would help realize the country's aspiration of having a highly educated citizenry to meet the challenges of the 21st century. (Table 5 discusses the implications of the first generation of reform. Table 6 summarizes the objectives, issues, and suggested measures for the second wave of reform).

Peru thus find itself at a crossroads with respect to education policy. The current situation, which partially reflects the success of the first generation of reform, represents important accomplishments. That path could be continued. A second generation of reform, however, would take a path of focussed commitment to improving education as a more central goal in itself and means for accelerating growth and reducing poverty. The following paragraphs summarize this report's conclusions concerning the potential, the content, and the cost of second generation of reform.

5.1. Improve Equity

Although public expenditure on education on the whole has been distributed relatively equitably, poor households still have a disproportionately heavier financial burden than rich households for their children's education. The disparity in household spending has led to inequitable learning outcomes. The indigenous people are among the poorest in the country. To equalize opportunity, resources have to *target* the disadvantaged groups.

The options include a range of supply- and demand-side measures. On the supply side, the Ministry should extend the provision of a class set of textbooks to all levels of secondary education and supply an additional class set of enrichment reading materials throughout basic education. Given the major difference made by textbooks (as revealed in the 1996 test), this should be the first priority. Since the Ministry is already experienced in the development and provision of textbooks to primary education through the

MECEP project, it is both easy and logical for it to extend them downward to cover preschool and upward to cover secondary education. Since this intervention does not involve changing the administrative or finance structure, it is feasible and achievable. This might raise achievement and help retain more children in the system. Meanwhile, the Ministry should also explore the feasibility of providing cost-effective educational technology such as interactive radio to supplement classroom teaching, or audio materials to assist second-language acquisition to support multigrade teaching.

A number of countries in the world have experience with using interactive radio to reach rural communities. Some of experiences have been properly evaluated and found to be highly cost-effective when children are tested for what they learn in comparison with those who are in traditional classrooms. Given Peru's difficult terrain, radio sets can be given to families who have school-age children but live in remote communities. An estimated 6 percent of total students are in single-teacher schools in remote communities. Although radio broadcasts can be used for school instruction, the best use of this medium is during adverse conditions, such as rain, snow, and flood, when children who cannot travel to school can stay home and still learn the lesson. When this is done in combination with programmed text, this will help them overcome the problem of their own and their teacher's absenteeism. Parenting education can also be broadcast by radio so that parents get more involved with their children's education.

Specifically helpful to indigenous children is the expansion of bilingual and multicultural education through strengthening teacher training programs in these areas, as well as in multigrade teaching, and recruitment of indigenous teachers to these programs through affirmative action and scholarship. Arregui, Hunt, and Díaz (1996) found that the vast majority of teachers are employed in the department they were trained in. Therefore, ISPs in departments heavily populated by indigenous people should offer bilingual and multicultural programs that are tailored to the groups within their jurisdiction. At present, offerings in these programs in ISPs are extremely limited. To seriously improve the learning outcomes of indigenous children, the central government should support such programs through its allocation of resources. Also, given the findings from the 1996 test that showed a relationship between indigenous teachers, except Aymara, and lower student test scores, it signals that indigenous teachers need better preparation during their training. Therefore, not only should there be bilingual education teacher training programs, but there should also be some form of compensatory education in ISPs to assist indigenous trainees whose performance might be weaker than average.

The training of indigenous teachers needs to be complemented by the provision of bilingual textbooks and educational materials including interactive radio or audio and video tapes throughout primary education. Currently, the resources that have gone into these programs are negligible, and that is why the impact has yet to be demonstrated. Other countries that have adopted bilingual education, such as Guatemala, have positive results. It is worth examining the approaches in these countries in order to improve on them. Given that Peru has many indigenous groups who speak different languages, and that indigenous communities in the Amazon regions are small and dispersed, such intervention is predictably expensive. Nonetheless, given the cost of marginalizing indigenous

people, the benefit of poverty alleviation and social cohesion is high. Although it is unrealistic to develop bilingual texts for all groups within a few years, this should be a long-term project, with targets to be met within a medium term time frame of, say, a decade. Training of teachers for rural schools should also emphasize multigrade teaching. Again, this should be complemented by the provision of program materials.

The Government is already planning to provide distance learning through educational television to enable children in remote areas or out-of-school children access to secondary education. While this is a commendable move, it should be noted that a range of support measures, such as face-to-face tutorials, needs to be put in place in order for distance education to work. Otherwise, dropout rates could be very high.

To ensure that *all children* learn the requisite skills, formative and summative assessment could be used more systematically and frequently. Those students who are falling behind should be provided remedial education during the school year as well as during holidays. The Ministry has adopted an automatic promotion policy from Grade 1 to Grade 2 in order to improve the promotion rates and reduce dropout rates. The impact of this measure on learning outcomes should be evaluated. Given that automatic promotion policy has been associated with failure for students to acquire the requisite skills in many countries, timely compensatory education might be a more cost-effective intervention in the long run. This might benefit particularly disadvantaged children.

Another important issue is poor nutrition and health of children in poverty which has contributed to under achievement in many countries. Although this study on education has not devoted much discussion on the topic, the companion World Bank study on health has examined the issue (World Bank, 1999b). Addressing the health of school-age children either through services provided directly through the schools, or through targeted publicly financed insurance such as the on-going *Seguro Escolar,* would improve attendance and learning. At the same time, it is desirable to consider targeted expansion of the school feeding program (such as *Desayunos Escolares*), given initial positive findings of favorable outcomes with respect to nutrition, health, and attendance (Pollitt, Jacoby, and Cueto, 1996). Expansion of the school feeding program would need to be weighed against typically high costs of such programs, as well as the feasibility of reaching schools in remote areas. Obviously, such multisectoral interventions require a much more coordinated approach between ministries such as MINSA, PROMUDEH, and PRES.

Demand-side financing measures such as scholarships and grants for indigenous or poor children should be explored to enable them to defray the direct costs of education. The mechanism for distributing such scholarships or grants needs to be worked out carefully to prevent abuse. An indirect mechanism is to give schools that have an indigenous enrollment exceeding a certain percentage an additional per student instructional grant based on attendance. The money could be used by the school for purchase of instructional materials, to provide compensatory education, or to subsidize students' clothing or transportation costs.

5.2. Enhance Quality

A key measure of qualitative improvement is reduction in variance in student achievement. The 1996 test shows that textbook availability and usage, homework assignments, the characteristics and roles of teachers and principals, and parental role and expectations can reduce between-school differences in learning outcomes. Besides the interventions through textbook provision and teacher training, educating parents about good child-rearing practices and the positive effects on achievement of school attendance, after school studies, and parental involvement in their children's learning by means of the mass media could also help to improve learning outcomes. The policy of universalizing early childhood education to enhance students' school readiness might help reduce late entry and repetition and reduce the between-student differences. Grants for compensatory education or to defray the direct private cost of education to facilitate attendance of indigenous students and girls, who tended to have lower average math scores, may also make a difference.

These interventions could only have maximum impact if they are accompanied by systemic reform that focuses on standards. The necessary components include (i) setting standards for student learning, (ii) setting standards for teaching, (iii) strengthening teacher education and professional development, (iv) providing incentives for teacher knowledge and skill upgrading, and (v) encouraging schools to organize for learning. In other words, making the career of the teaching force more like that of other professions should be the center piece of reform, and standards should drive the change in each stage of professional development. Part and parcel of this reform is to make available indicators on performance by school (test scores; repetition, promotion, and dropout rates by grade) available not only to the DREs, USEs, schools, and teachers, but also to parents, students, and the public. This will allow the families and public to benchmark the schools' performance against other schools. This will generate pressure for improvement, and will also build the groundwork to set up an accountability system.

At the same time, studies on determinants of student achievement at all levels of education could be used to decide what qualifications should be required of teachers and at what level of education. This kind of study would be very similar to the one reported in Background Note 4. If teachers graduated from universities and from ISPs are found to be associated with higher student achievement even at Grade 4 levels, relative to teachers who entered the profession through a different ladder, then it is very important to ensure that teachers are appropriately qualified. To ensure that qualification matches all the requisite competencies to be a teacher of a given grade and subject, teacher pre-service and in-service training should be examined closely and reformed to ensure high standards.

The broader issues that need to be addressed are: (i) the disparity in qualifications between rural and urban teachers; (ii) weakness in subject matter knowledge of teachers, particularly in secondary education; (iii) the morale problem related to different status of employment between appointed and contracted teachers; and (iv) the lack of incentives for higher performance. The first issue justifies increasing the salaries of rural teachers to compensate them for hardship positions, combined with a job rotation system so that they have an opportunity to return after a few years, with investment in rural school inputs to

make teaching there more attractive, and with stepped up efforts to recruit indigenous teachers into teaching in their communities. The second issue calls in the short run for raising the salary scale of teachers without title but who have university degrees in other disciplines to the same level as teachers with titles in order to enlarge the pool of teachers with stronger subject matter knowledge. In the long run, it requires changing the academic requirements of secondary school teachers and reforming ISP curricula. The third issue calls for unifying a two-tier employment status to make open-ended contracts, with the tenure determined by evaluated performance. The fourth issue really requires the support of a systemic reform geared to establishing an accountability system that rewards group and individual performance, preferably based on value-added efforts.

Given that data on teachers are not available, it would be useful to conduct a census of teachers, as part of the school census to be mentioned below, to review their age, qualifications and specialized areas, experience, subjects taught, and various types of compensation received. This would provide data that could serve as the basis of a review of the supply and demand for teachers and the financial implications of increasing the salary differentials between urban and rural teachers, tying promotions to demonstrated competency, and providing monetary incentives to reward schools. Concomitantly, it is necessary to review the legal framework and incentives for teachers in private and public schools so as to provide a benchmark for improvement. Inevitably, the policy towards teachers and their pre-service and in-service training will make a lasting difference in quality.

These measures require institutional and cultural change, which take time. Consensus with stakeholders (namely, teachers) needs to be reached in order for the reform to take root. Therefore, as technical measures need to be put in place (such as spelling out teaching standards for each subject and grade, evaluation tools, and assessment of fiscal impact of changing salary structures), consensus building process should be set into motion by reaching out to teachers, NGOs, and the business community.

5.3. Improve Efficiency of Resource Use

The review of public expenditure in this report has only been able to access data down to the departmental level, but not to the USE level. Hence, the report was unable to evaluate the actual unit cost by level and by urban and rural areas, across departments. Even the MEF does not have the expenditure data; it only has the budget figures. To piece together a complete picture of the nation's public spending pattern, particularly to evaluate the equity and efficiency of resource use, in order to adjust policy, it is of utmost importance that monitoring continues to take place to cover the following areas.

- *The trend of public spending on education over time gross and net of pension.* It would be desirable to update and extend the analysis of public expenditure on education to cover not only school-related expenditure, but also education-related subsidies to households (such as school health programs financed by the Ministry of Health, school feeding programs under the PRES), as well as other education-related expenditures under PROMUDEH (such as early child care and literacy programs).

- *Differential spending by urban and rural areas at the USE level.* This is equally important so that interventions can be designed to equalize the resources allocated to different schools. This should take into account departments' own resources and capital expenditure allocated to the USE level by PRES (through FONCODES). The growth of inequity in allocation of public resources should be watched closely.

- *Indicators of learning outcomes (e.g. test scores).* These would be logical areas for monitoring so that input measures can be tied to outcomes. The existing questionnaire does not contain questions on school-level resources and public allocation per student. Expansion of the questionnaires is desirable to cover these and other variables on family background (parental education, income, family resources, amount of household expenditure on education), study habits, and teacher characteristics, to assess determinants of achievement. It would help analysis if more questions are constructed for obtaining continuous variables rather than categorical variables. Studies of determinants of achievement would be helpful to identify effective policy interventions to help disadvantaged schools.

- *Household expenditure on education.* This would be another key area to follow up. Given that INEI conducts such a survey annually, the data source for such an undertaking is available; only analysis needs to be undertaken. Closer cooperation between INEI and MED would help improve the questionnaire for data collection so that the education portion contains the relevant questions that can address issues for household finance. For example the Cuanto dataset used by this report merges tuition fees with transportation and lunch. This does not allow assessment of the impact of fees alone on a household's decision to send their children to one type of school versus another. The question of extra tutoring should also be included because this area is where the rich tend to spend much more than the poor and it provides a proxy as to how much additional money is needed to ensure desirable learning outcomes. Analysis of the household survey would enable the Ministry of Education to monitor distribution of public expenditure by consumption or income quintile (Lorenz curve), changes in the elasticity of demand (Engel's curve) for education, and private and social rates of return to education.

Currently, responsibility for all aspects of education is fragmented across ministries and institutions—MED, universities, regions, decentralized institutions, PRES, as well as PROMUDEH and MINSA. There is an urgent need to improve the coordination of educational policy and financial matters between these budgetary entities. It is recommended that a sectorwide coordinating body be established that meets at least quarterly to review overall education policy, performance indicators of each subsector, and intrasectoral allocation of resources (gross and net of pension), in order to ensure consistency of overall education policy and finance. The minutes could be made available to all ministries concerned to keep them informed, as well as to CIAS to improve intersectoral coordination.

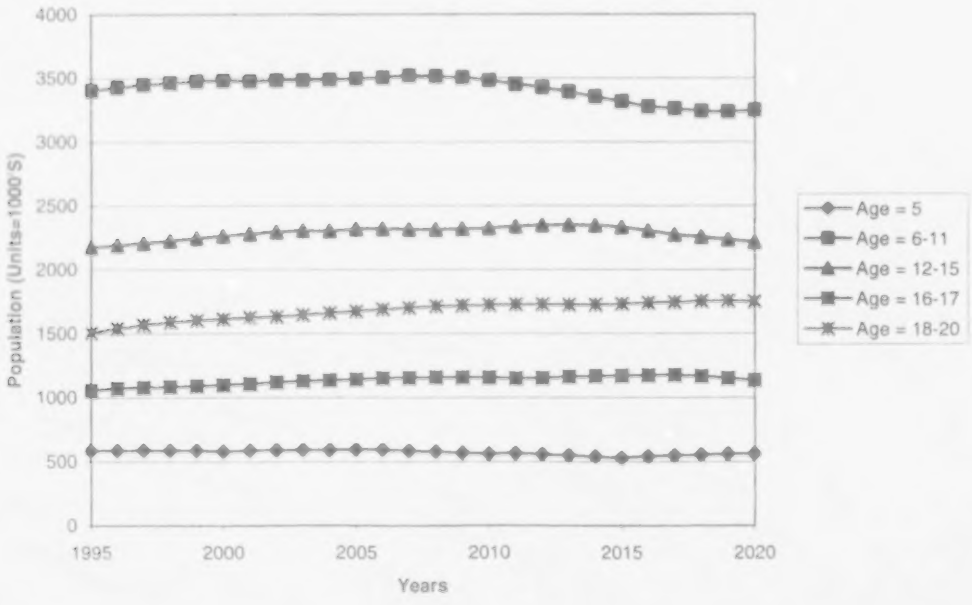
Given that there is no accurate information on how many teachers (both appointed and contracted) are in the system, it is very difficult to assess whether resources have been used efficiently. At the same time, the lack of information in school-level finance in

both public and private schools impedes the formulation of policy towards regulating private schools to ensure standards and safety, and towards expanding secondary education through better use of private-school capacity and resources (such as the use of vouchers to buy places in private schools). The combined need to have accurate information on teachers and school-level finance in public and private schools, therefore, calls for conducting an education census. This needs to be taken at the school to obtain information on schools, teachers, and students. Information could provide a useful database to map out strategy to expand secondary education and to improve quality of primary education, as well as to explore options for formula-based funding.

Currently there is an inflexible criteria for allocating resources, based on the number of teachers on permanent payroll in 1995 without responding to the reality of changing student populations. This is not an efficient mechanism in the long run. This inflexible criteria has not taken into account the rural to urban migration and also disadvantages the populations with very high birth rates, namely, the indigenous and low income populations. It is desirable to evaluate the option of using capitation grants in large public schools (but using a different formula for small rural schools) as a basis of allocations, to reflect the reality of changing student populations and to make allocation decisions transparent. Schools should be given the discretion of how best to use the capitation grants in terms of purchasing a mix of inputs, such as hiring teachers, buying instructional materials, or installing lab facilities. In addition, certain categorical grants should be provided to regional education directorates for them to earmark assistance for disadvantaged areas/schools/persons.

Increased international competition and technological change have led to growing demand for a higher level of skills in the labor force. This has translated into rising pri-

Fig. 35. Estimates and Projection of School-Age Population, 1995-2020



vate returns to higher education, which will fuel further demand for higher education. To properly support higher education and ensure quality, it is important to improve the transparency of the funding mechanism, with incentives to reward efficiency and quality, as well as to share costs with students, who are the chief beneficiaries of their own education. Increased cost sharing also needs to be supplemented by student financial assistance such as student loans to ensure the academically deserving will not be disqualified due to financial constraints.

Although this report does not cover higher education, given that policy and expenditure on higher education impact on lower levels of education, it will also point out areas for further investigation. In-depth review of funding of higher education is desirable to assess options for introducing funding formulas for higher education (such as fulltime equivalency based allocation) with incentives for improving efficiencies (such as that a certain allocation is based on graduation rates within a certain time frame), and examine the adequacy and impact of cost sharing (such as estimating the elasticity of demand and a survey of students' financial situation and expected earnings after graduation). This exercise should involve MED, MEF, and higher education institutions, and inform overall education policy of the country.

5.4. Conclusion

The 1993 Constitution enshrines the principle of compulsory and free preschool, primary, and secondary education. To the extent that there is strong evidence in many countries of the positive impact of preschool on subsequent student behavior and achievement, it is educationally very sound for the Ministry to include preschool in basic education. As for secondary education, the projected growth of the cohort between 12 and 15 years of age in the first 15 years of the 21st century highlights the need to address their educational needs (Figure 35). Given the association of high crime rates and poor, young males in many countries, the education of adolescents will provide many unmeasurable social benefits.

Population projections by the World Bank estimate that the cohort of ages 6 to 11 (the primary education age group) will rise modestly between the present and 2010 and then decline afterwards, while the 12-to-15, 16-to-17, and 18-to-20 age-groups will increase throughout the first two decades of the next century. There is likely to be increased pressure for education resources, including demand for qualified teachers in secondary and tertiary education. The reprieve provided by the declining primary school-age population would come only after 2010. If nothing is done immediately, many cohorts of students will miss their educational opportunity and sink into poverty.

What might the resource requirement be to meet the Constitutional Mandate of universal basic education? Based on a rough estimate, it would probably cost the country an additional 2 percent of GDP, net of pensions, if the minimum standards are to be achieved for *all students at all grade levels*. This would still be within the range of the regional average of the Latin American Region. This would enable the government to simultaneously improve internal efficiency and extend access to the out-of-school population in order to ensure every child the opportunity to acquire the skills of a complete

secondary education cycle. This would also raise per student spending. Although the exact costing could only be done after knowing the Government's input mix in providing universal coverage, simply relying on efficiency gains or shifting resources in the margin could not provide the resources necessary to meet the Constitutional Mandate.

Many countries have committed far more public resources to education than has Peru, but without achieving universal coverage for basic education. For these countries, increasingly binding fiscal constraints and continued needs to expand coverage sharply constrain the policy agenda. Peru, in contrast, has positioned itself to initiate a major drive to consolidate equity gains while improving quality.

Peru has indeed reached a crossroads concerning education. The status quo reflects substantial progress, and one direction for the future would continue that path. The other and more ambitious direction would entail commitment to a reoriented human resource strategy for poverty reduction and economic growth. This path would require, over time, substantially increased public expenditures on education. An increase from 2.4 percent to 4.5 percent of GDP net of pension expenditure (to the Latin American average) is, for Peru, feasible in the medium term, given its past experience of limited public financial commitment to education. With such an increase in expenditures, financing a second-generation of reforms along lines discussed earlier, Peru has the opportunity to markedly enhance the intellectual ability and competitiveness of its labor force within a generation. No policy challenge is more significant.

Table 5: First Generation Reform and Its Implications for Second Generation Reform

First generation reform	Public finance	Household finance	Equity, quality, and efficiency	The teaching profession
Rationalization of public service, increased use of contract staff in the central ministries, and privatization of pensions.	Measures to contain cost provide the starting point to improve efficiency in the use of resources. Potentially, public resources can be used to improve quality or expand access. It is important to establish transparent funding criteria to improve efficiency and equity.	There is no immediate impact on household finance of education. But if these measures release more public resources to improve quality or extend access, households will benefit from it and match public investment.	Could be negative in the short run, but should improve quality in the long run, if an accountability system is properly set up.	Negative effect on morale in the short run. Fairer to offer an open-ended contract for all and use performance to determine duration of employment. Need to set up incentives to reward performance and introduce accountability. Lack of timely statistics of appointed and contracted teachers on the payroll hinders development of policy.
Increasing attention to meritocracy and quality.	Need to establish transparent evaluation criteria and need policy and resources to reward performance. This will ultimately improve the efficiency of resource use.	If the quality of education has markedly improved, households are likely to be willing to invest even more and start the virtuous cycle.	Monitoring and evaluation should underpin an accountability system that is central to a merit-based system.	In the short run, teachers will feel pressured. Need to support improvement in pre-service training and in-service professional development. Meritocracy should raise status of teachers in the long run. Need to change salary scale to attract and retain competent people in the profession.
Expansion of constitutional mandate for basic education.	Expanded mandate needs to be supported by increased public investment to realize the goal.	Increased public investment will have a matching effect to solicit additional private spending.	Need targeted support for the poor, indigenous, and rural students to ensure equity of learning outcomes. There must not be a trade-off between quality and quantity.	Affects the supply and demand for teachers. Need to pay special attention to the quality of teacher pre-service and in-service training.

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Legal encouragement of private education and the growth of private education.	Opting out of the public system by the urban rich and middle class may free up resources for the working class and rural students. Lack of supply of private schools in rural areas calls for increased public investment there.	Led to mobilization of more private resources for education. Demand for private education will induce supply in cities, and greater availability of good quality of education may attract more middle class to go for it.	Need to improve quality of public education to avoid further deepening the socioeconomic divide. Need to accredit private schools for quality assurance.	Need to improve incentives in the public system to attract good teachers. Nonmonetary incentives include making work environment attractive and breaking teacher isolation.
Regionalization of administration and deconcentration of services.	Affects the budget process, intergovernmental transfer of resources, and balance of power. Need to strengthen the ability of the regions to deliver quality services by giving them more discretionary power and resources.	Neutral at the beginning but can be positive if the regions become more effective in meeting local needs and in assisting the poor.	Need to set national standards, monitor performance, and undertake measures to reduce regional variation in learning outcomes.	Need to provide quality assurance through accreditation of teacher training programs, and certification of teachers. The regions should have more flexibility in the recruitment and deployment of teachers.

Table 6: Summary of Policy Options

Objectives	Issues	Suggested measures
Improve equity	Inequity in learning outcomes of poor, rural, and indigenous students due to inadequate public resources; unwillingness of qualified teachers to serve in remote communities; and perhaps poor nutrition and health and lack of preparedness of students themselves.	Provide teachers' guides, textbooks, workbooks, supplemental reading, and audiovisual materials and media (for example, interactive radio) throughout 11 years of basic education to *all* schools. Provide radio sets to families with school-age children in remote communities to enable them to access lessons. Expand bilingual education programs; provide bilingual instructional materials, recruit indigenous teachers to serve their own communities, train rural teachers in multigrade teaching. Increase compensation to rural teachers and assure job rotation to induce teachers to teach in rural communities. Address the health of school children either through services provided directly through the schools, or through targeted publicly financed insurance such as the on-going *Seguro Escolar*, to improve attendance and learning. Consider targeted expansion of the school feeding program given initial positive findings of favorable outcomes with respect to nutrition, health, and attendance. Weigh costs against scope of expansion of the school feeding program. Provide information (through the mass media) to parents about how good child-rearing practices and involvement in their children's learning enhances children's interest in learning and improves their school achievement. Extend preschool education to disadvantaged communities in order to improve school readiness. Provide compensatory education to ensure all children learn all requisite skills relevant to their grade level.
	Inequity in access to secondary and tertiary education of poor, rural, and indigenous students due to lack of supply and inability of households to pay.	Establish distance learning programs (by a combination of programmed text and communication media) to provide secondary education to rural communities. Provide scholarships and grants to rural children to enable them to attend secondary schools.

Table 6: Summary of Policy Options

Objectives	Issues	Suggested measures
Enhance quality	Lack of incentives to attract and retain competent people in teaching and to improve performance.	Change salary scale to better reward secondary school teachers, as well as those who have university and postgraduate degrees in disciplines other than education. Unify employment status and offer open-ended tenure to be determined by performance. Reward schools that show improvement. Set standards for student learning; set standards for teaching, strengthening teacher pre-service and in-service training (possibly changing the academic requirement for teaching in secondary education); provide incentives for teacher knowledge and skill upgrading; and encourage schools to organize for learning. This entails improving the tools for student assessment and teacher evaluation, as well as building consensus with all stakeholders.
	Lack of information for benchmarking own performance to know how much to do in order to improve.	Publish information on performance by school and distribute to relevant actors (DREs, USE, schools, and parents).
Improve efficiency of resource use.	Lack of sectoral overview of policy to assess its coherence and consistency.	Monitor the trend of public spending on education over time (gross and net of pension), particularly differential spending by urban and rural areas at the USE level; track indictors of learning outcomes; survey household expenditures on education and follow changes in the elasticity of demand as well as the private and social rates of return.
	Insufficient coordination of educational policy and financial matters between the budgetary entities that have responsibility for education (MED, universities, decentralized institutions, Regions, PRES, PROMUDEH).	Establish a sectorwide coordinating body that meets at least quarterly to review sectoral policy, performance indicators of each subsector, and intrasectoral allocations to ensure consistency of overall education policy and expenditure.
	Insufficient information on teachers and school-level finance in public and private schools to guide policy to improve quality and expand access.	Conduct an education census to obtain information on teachers' profiles and school-level finance.

Table 6: Summary of Policy Options		
Objectives	**Issues**	**Suggested measures**
	Inflexible criteria for allocating resources based on the number of teachers on permanent payroll without responding to changing school-age population.	Clean up payroll list and set up a centralized database. Consider using funding formula based on average daily attendance with grants to compensate for various categories of disadvantage. Give schools greater discretion to use resources.
	Potential issue of intra-sectoral allocation between universities and lower levels of education.	Given that policy and expenditure on higher education impacts on lower levels of education, in-depth review of funding for universities is desirable to assess options for introducing funding formulas with incentives for improving efficiency, and for cost-sharing.

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Background Notes

Background Note 1.
The Structure of Education

The existing structure of education comprises four levels: initial, primary, secondary, and tertiary. (See Appendices 1.1-1.3 for enrollment in public institutions, Appendices 1.4-1.6 for enrollment in private institutions, and Appendices 1.7-1.9 for total enrollment). Initial education is offered in daycare for those under the age of 3 and in kindergartens for those between the ages of 3 and 5. There is also a nonformal system of initial education. It is estimated that about 20 percent of those under 5 are having some form of initial education (INEI, 1997). In 1997, 522,000 children enrolled in initial education in the public system, and 147,000 in private organizations. In a recent proposal for restructuring education, one year of initial education is to be made compulsory and form part of basic education.

Primary education comprises six grades, intended for the age group between 6 and 11, but also available to adults who have not received it. In 1997, about 3.7 million persons enrolled in public formal and nonformal programs, and 491,000 in private programs. The majority of primary schools are coeducational and the program of study comprises 25 hours per week during 36 weeks per year (900 hours per annum).

Secondary education is offered to the age group between 12 and 16, as well as to adults who did not have it. In 1997, about 1.6 million enrolled in public secondary schools, and 318,000 in private schools. Secondary education is organized in two cycles: the first has a common curriculum for all students in Grades 7 to 8, and the second has a diversified curriculum of three years, divided into science and humanity streams. Secondary education is offered at 36 hours per week for 38 weeks in a year (1,368 hours per annum).

Tertiary education includes nonuniversity and university education. Nonuniversity institutions include teacher training institutions (*institutos superiores pedagógicos* or ISPs for short), technical education institutions (*institutos superiores técnicos* or ISTs), and schools for the arts. In 1997, 211,000 students attended public universities, and 129,000 private universities. Another 165,000 students enrolled in public tertiary institutions, and 139,000 in private institutions.

In 1997, MED proposed major changes in the structure of the system, with the aims to improve the articulation between levels, to meet needs of a changing labor market, and to improve system efficiency and organizational flexibility. It pledged to universalize one year of initial education, improve the quality of primary education, reduce secondary education from five to four years, and introduce two years of preparatory course work (*bachillerato*) which will provide the transition to tertiary education or to the world of work. In other words, basic education will comprise 11 years of instruction, which includes one year of preschool, six years of primary, and four years of secondary education.

What is new is not only the structural change but the introduction of certifications of study at three levels: at the end of basic education, *bachillerato*, and tertiary nonuni-

versity education, respectively. Accreditable capacities of basic education will include: (a) comprehension of reading, editing, communication, and expression; (b) development of logic and mathematics; (c) management of the basics of technology and informatics; (d) facility for continuous learning and holistic reasoning; (e) creativity and imagination; (f) understanding of environment; (g) local, national, and universal culture; (h) basic work and organizational abilities; and (i) basic knowledge of an international language. Accreditable capacities of the bachillerato will include: (a) productive use of resources (time, space, skills, and technology); (b) abilities to search and select information; (c) facility for analysis, synthesis, abstraction, and systematization; (d) proficiency in an international language; (e) intermediate professional competency; (f) tools for management and self-employment. Students will be certified after having had no less than 2,500 hours of studies in tertiary nonuniversity education.

The proposed bachillerato is divided into two streams: (a) scientific and technological, and (b) scientific and humanistic. The former will prepare for studies in engineering, medicine, mathematics, the sciences, and accounting in universities, and technical courses in tertiary nonuniversity education. The latter will prepare for studies in law, education, the social sciences, and humanities in universities, and tourism, graphic arts, translation, catering, and public relations in other tertiary education. In each stream, there will be a core curriculum and other subjects that prepare for the world of work. The core curriculum is shared by both streams and includes science and technology, earth science, oral and written communication, economics and management, informatics, history of Peru, natural philosophy, and international language. Bachillerato can be offered by (a) secondary colleges as add-ons to their four years of secondary education, (b) universities before the beginning of undergraduate studies, (c) postsecondary institutes before the beginning of two years of tertiary education, and (d) academic institutes specialized just in offering bachillerato.

This ambitious plan requires investment in infrastructure, curriculum development, and teacher training. The implementation of bachillerato is sequenced as follows. In 1997, the proposed structural change was made public; the modernization of the secondary curriculum has begun; the transitional fifth year of secondary schooling was elaborated; and the bachillerato curriculum was proposed. Subsequently, a law was promulgated to give the structural change legal force; new curriculum and training of principals and teachers was piloted; the development and distribution of education materials in secondary education was initiated; a new administrative system was set up; and infrastructure was planned. Thereafter, a second application of transition curriculum in the fifth year of secondary was implemented; training of teachers; and equipping institutions for implementation of bachillerato with followup and monitoring. Full scale implementation was expected to begin in 2000, affecting 200,000 young people each year. The following year will see the first batch of graduates from bachillerato. The effort to revamp the education system is expected to come to fruition in 2007.

Background Note 2.
Income Elasticity of Demand for Education and Engel's Curve[1]

The share of household expenditures for education were analyzed using an Engel equation framework. The explanatory variables include the logarithm of income (here proxied by total expenditure), the logarithm of the size of the household, and a set of variables intended to capture the gender and age composition of the household (with age brackets set up to correspond to the various levels of education in Peru). The explanatory variables also include a dummy for residence in the Lima metropolitan area, and three variables indicating, respectively, the education level of the household head, whether or not the household head is male, and whether or not the household head belongs to an indigenous group. The focus of analysis in this section is the expenditure variable, but the other variables are included as "control" variables, so that the coefficient estimates reported in this section are not biased. In other words, it is important to be sure that what we call the effect of income is indeed the effect of income, and not, say, the effect mainly of the education of the household head. In addition to estimating the Engel function for expenditure, we also provide estimates for expenditures on Food, on Health, and on Other Expenditures. The object of the analysis is to compute income elasticities for each of the budget shares.

It is an empirically established fact that the income elasticity for food shares is negative, because poor households need to spend larger shares on food, but an a priori judgment cannot be made about the income elasticities of the other budget shares. In particular it is important to compare the income elasticity for education with those for health. The object of the analysis is to estimate a value for b, the slope on income in the budget share regression, as well as η, the income elasticity which tells us the percentage points by which the budget share goes up for a given percentage increase in income.

The estimates from the Engel function analysis are presented in Table 1. It can be seen from the table that the average budget share for education is 0.0467 and the coefficient on log total expenditures is 0.0128. The respective values for health related expenditures are 0.0411 for the average budget share and 0.0151 for the coefficient on log total expenditures. The income effect of food has the expected negative sign and the coefficient on log total expenditure for food share is of the same order of magnitude as reported from other countries.

It is of interest to note that the dummies for Lima, rural location, female head, and indigenous head of household are economically and statistically insignificant in the education share regression. Some of these dummy variables are important in the food share regression, such as the 0.1315 effect of a rural location. The lack of significance of the dummy variables for the education share, in contrast with the significance for food share, tells an important story about the stability of preferences for education across households

[1] This analysis was undertaken by Suhas Parandeker.

which vary across these measured variables. The estimates of elasticity, derived from the regression coefficients are reported in Table 2.

Table 1: Determinants of Household Budget Shares

	Budget Shares				
Explanatory variables	**Education**	**Food**	**Health**	**Other**	**Mean**
	OLS Coefficient (t-value for H_0 Coeff. = 0)				(Std. Dev.)
Intercept	-0.1424	0.8066	-0.0970	0.4328	
	(-10.02)	(24.078)	(-6.455)	(13.52)	
Logarithm of total household expenditure	0.0128	-0.0377	0.0151	0.0098	9.2304
	(8.113)	(-10.139)	(9.072)	(2.750)	(0.7202)
Logarithm of total household size	0.0187	0.001	0.0046	-0.0242	1.5189
	(8.755)	(0.199)	(2.035)	(-5.052)	(0.4920)
Proportion of boys aged 0-5 years	-0.0179	0.1294	0.0026	-0.1142	0.0706
	(-2.209)	(6.769)	(0.307)	(-6.249)	(0.1174)
Proportion of boys aged 6-11 years	0.0746	0.1185	-0.0095	-0.1837	0.0660
	(9.109)	(6.133)	(-1.091)	(-9.951)	(0.1130)
Proportion of boys aged 12-16 years	0.1120	0.0489	-0.0131	-0.1477	0.0483
	(12.43)	(2.3000)	(-1.377)	(-7.279)	(0.1000)
Proportion of boys aged 17-22 years	0.0730	0.0322	-0.0119	-0.0932	0.0505
	(8.875)	(1.661)	(-1.367)	(-5.037)	(0.1064)
Proportion of girls aged 0-5 years	-0.0321	0.1612	0.0118	-0.1409	0.0671
	(-3.970)	(8.443)	(1.383)	(-7.724)	(0.1163)
Proportion of girls aged 6-11 years	0.0717	0.0728	-0.0020	-0.1425	0.0607
	(8.503)	(3.661)	(-0.234)	(-7.498)	(0.1085)
Proportion of girls aged 12-16 years	0.0805	0.0899	-0.0169	-0.1535	0.0470
	(8.711)	(4.125)	(-1.728)	(-7.374)	(0.0944)
Proportion of girls aged 17-22 years	0.0718	0.0427	-0.0081	-0.1063	0.0560
	(8.419)	(2.125)	(-0.906)	(-5.537)	(0.1069)
Proportion of girls aged > 22 years	0.0209	-0.0008	0.0078	-0.0279	0.2815
	(3.198)	(-0.054)	(1.122)	(-1.891)	(0.1848)
Dummy for residence in metropolitan Lima	-0.0032	-0.0130	-0.0071	0.0234	0.2893
	(-1.646)	(-2.812)	(-3.430)	(5.286)	(0.4357)
Dummy for residence in rural area	-0.0010	0.1315	0.0075	-0.1380	0.3481
	(-0.515)	(27.00)	(3.436)	(-29.64)	(0.4852)
Female head of household	-0.0020	-0.0148	-0.0007	0.0175	0.1563
	(-0.776)	(-2.434)	(-0.248)	(3.008)	(0.3602)
Indigenous head of household	0.0022	0.0022	-0.0035	-0.0009	0.2335
	(1.182)	(0.493)	(-1.749)	(-0.219)	(0.4111)
Education in years of the head of household	0.0019	-0.0049	-0.0011	0.0040	7.7645
	(10.15)	(-10.81)	(-5.208)	(9.257)	(4.8485)
Mean value of budget share	0.0467	0.5050	0.0411	0.4072	
R^2	0.28	0.49	0.04	0.48	
F value	91.8	233.5	8.94	220.8	
Sample Size (N=3820 Households)					

Table 2: Elasticity Estimates from Engel's Curves				
Elasticity	Expenditure Group			
		Food	Health	Other
Budget share with respect to total expenditure	0.274	-0.0747	0.3674	0.0241
Specific expenditure with respect to total expenditure	1.274	0.9253	1.367	1.024
Budget share with respect to household size	-0.6133	-0.0969	-0.0613	0.0769
Specific expenditure with respect to household size	-0.6133	-0.0969	-0.0613	0.0769

The findings from the Engel's curve analysis are a mixed blessing. On the one hand, the income elasticity is a low 0.27, and education expenditures are considered to be a necessity by Peruvian households.[2] This is a positive finding, as it indicates that there is a strong underlying demand for education in Peru. A high income elasticity would indicate that the item of expenditure is a luxury—households spend money on luxuries when they have the money, but simply do without it when they do not have money. The relative magnitudes are small, but the evidence also suggests that education expenditures are less responsive to changes in income as compared to expenditures on health.

However, from the point of view of educational policy, the implication is that we cannot rely on general increases in income to bring about greater expenditures on education. For every doubling of household income, the budget share spent on education would go up only by a quarter. Add this finding to the fact that levels of household expenditure on education vary vastly by income level. (This fact can be seen from the Lorenz curve analysis reported in the main body of this report—the total amount spent on education by the richest quintile in Peru was more than 13 times the total amount spent on education by the poorest quintile.) The findings show the need for specific policy instruments that will address the inability of poorer households to incur additional expenditures.[3]

[2] Mwabu's work on Kenya indicated a much higher income elasticity of education expenditures of 0.73.

[3] To make sure that the conclusion was not based just on one pooled set of regressions, the regressions (not reported here) were run separately for subsamples by indigenous and nonindigenous, rural and urban, and poor and rich. Consistently, the pattern is that the income elasticities are lower for the more disadvantaged groups.

Engel's Curves: Formulae for Elasticity Estimates

The Engel curve estimates are based on the following equation, presented as Equation (3) in the Working Paper by Germano Mwabu.[4]

$$w_i = \frac{p_i q_i}{x} = \alpha_i + \beta_i \log(x) + \eta_i \log(N) + \sum \gamma_{ij} (n_j / N) + \delta_i z + \varepsilon_i$$

where

w_i = the share of expenditure of the i th grouping of household expenditure items.

i = household spending for the four groups, *viz.*, education, health, food, and other expenses. (The share is conceptually equal to p_i times q_i, the price times the quantity, divided by the total expenditure x, but p_i and q_i are not empirically observed as separate entities in the actual estimation of the Engel curve.)

n_i = the number of family members in the age-by-gender group j. These groups range in the reported estimation from (boys aged 0 to 5 years) to (girls aged older than 22 years).

N = the total family size, thus (n_j/N) represents the relative size of group j in the family.

z = a set of control variables. These include (a) dummy for residence in metropolitan Lima, (b) dummy for residence in rural area, (c) female head of household, (d) indigenous head of household, and (e) education in years of the head of household.

ε_i = the error term in the regression equation, assumed to be i.i.d. normal.

$\alpha_i, \beta_i, \delta_i, \gamma_i$ = the parameters to be estimated.

The equations for elasticities follow from the above equation. Letting S_i represent the elasticity of the budget share for expenditure group i, and E_i represent the elasticity of specific expenditure with respect to total expenditure, x, and household size, N, the elasticities are:

a) $S_{ix} = \beta_i / w_i$
b) $S_{iN} = 1/w_i \, (\eta_i - \Sigma_j \gamma_{ij} \, (n_j/N))$
c) $E_{ix} = 1 + (\beta_i / w_i)$
d) $E_{iN} = 1/w_i \, (\eta_i - \Sigma_j \gamma_{ij} \, (n_j/N))$

[4] *Household Composition and Expenditures on Human Capital Inputs in Kenya.* by Germano Mwabu, Department of Economics, Yale University, 1994.

Background Note 3.
Private and Social Returns to Public Education in Urban Peru[5]

To estimate the private and social rates of return to public education, the rate of discount (r) was calculated. This discount rate equalizes the stream of discounted benefits to the stream of costs related to a given level of education at a given point in time. Thus, r can be determined by solving the following equation:

$$\sum_{t=1}^{T} \frac{(W_n - W_{n-1})_t}{(1+r)^t} = \sum_{t=1}^{K} (W_{n-1} + C_n)(1+r)^t \qquad (1)$$

where n = Level of education
T = Number of periods in the labor market of an individual with "n" education
W_n = Yearly labor income of individual with "n" education
K = Number of periods taken to achieve "n" education
C_n = Direct costs of studying for level "n" education.

The left hand side of the equation represents the benefits of achieving the additional level of education, which is simply expressed by calculating the present value of the differential between the earnings with "n" education and "n-1" education. The cost of studying "n" education is expressed in the right hand side of the equation, and its two elements represent the foregone earnings (assuming that no one works while studying) and the direct costs of having achieved "n" education (basically, tuition).

The data for this calculation was obtained from Instituto Cuanto's household survey of 1997. The analysis was restricted only to urban areas.[6] The sample was constrained to those individuals that had always studied in the public system, so the estimated rates of return would only capture the effect of public education. Instead of calculating streams of average income by age and level of education, we decided to estimate an earnings function to calculate the yearly income associated with the educational level and age of the individual. Hence, the following equation was estimated separately for males and females in the sample:

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[5] This analysis was undertaken by Jaime Saavedra, with assistance of Eduardo Maruyama.

[6] In Peruvian rural areas, household survey measurement of labor income is highly inaccurate due to high participation of self-employment, high seasonality, self-consumption, etc. Usually, expenditure data is recommended instead of income data for these areas.

$$\ln Y = \beta_0 + \sum_{n=1}^{4} \beta_{1n} EL_n + \beta_2 AGE + \beta_3 AGE^2 + \sum_{n=1}^{4} \beta_{4n}(AGE \times EL_n) + \sum_{n=1}^{4} \beta_{5n}(AGE^2 \times EL_n) + \beta_6 HY$$

(2)

where Y = Yearly labor income

EL_n = Dummy variable for educational level "n" (1 = Primary education, 2 = Secondary education, 3 = Nonuniversity higher education, 4 = University higher education)

HY = Hours worked per year.

This specification allowed finding different life-cycle earnings patterns for all educational levels (including no education), i.e. to find the streams of W_n required in equation (1). For the private rate of return, the basic assumption was that public education had no direct costs,[7] so the only costs of a given level of education were the foregone earnings. To calculate social rates of return we used 1997 nationwide public expenditure data by level of education and student as the direct cost of education. Table 1 shows the regression coefficients obtained from equation (2). Table 2 in Chapter 3 shows the results of solving equation (1), for males and females.

Given the low level of significance of many variables in the regression shown in Table 2 of Chapter 3, we tested the linear hypothesis that all the coefficients of a given level of education were equal to zero. For example, for primary education we tested the following hypothesis:

$$H_0 : \beta_{PRIMARY} = 0, \beta_{PRIMARY \times AGE} = 0, \beta_{PRIMARY \times AGE^2}$$

Results of these tests are shown in Table 2.

[7] It must be noted that even though tuition is free in the public system, families' expenditure in education might be important if we consider the amount spent in school uniforms, books, etc.

Table 1.
Earnings Functions Coefficients

(Dependent variable is the natural log of yearly earnings)

Variable	Coefficient	
	Female	Male
Constant	6.0424 ***	4.0796 ***
Primary	-0.8048	1.8678 ***
Secondary	0.2877	1.7883 ***
NU-Higher	-0.9007	2.4524 ***
U-Higher	-2.2527	1.2498
Age	0.0089	0.1389 ***
Age2*100	-0.0020	-0.1504 ***
Primary*Age	0.0606	-0.0657 **
Secondary*Age	0.0274	-0.0477
NU-Higher*Age	0.1238	-0.0698 *
U-Higher*Age	0.1927 ***	-0.0094
Primary*Age2*100	-0.0695	0.0725 **
Secondary*Age2*100	-0.0390	0.0538
NU-Higher*Age2*100	-0.1689 *	0.0812
U-Higher*Age2*100	-0.2266 ***	0.0311
Hours per year	0.0004 ***	0.0002 ***
Number of observations	1435	2535
R^2	0.27	0.26

*** p<0.01, ** p<0.05, * p<0.1

Table 2.
Linear Hypothesis on Regression Coefficients

Tests		Females		Males	
		F(3, 1941)	Pr ob>F	F(3, 3691)	Pr ob>F
$\beta_{PRI}=0$, $\beta_{PRI\times AGE^2}=0$	$\beta_{PRI\times AGE}=0$,	2.45	0.0619	10.45	0.0000
$\beta_{SEC}=0$, $\beta_{SEC\times AGE^2}=0$	$\beta_{SEC\times AGE}=0$,	6.12	0.0004	19.47	0.0000
$\beta_{NUH}=0$, $\beta_{NUH\times AGE^2}=0$	$\beta_{NUH\times AGE}=0$,	12.96	0.0000	20.25	0.0000
$\beta_{UH}=0$, $\beta_{UH\times AGE^2}=0$	$\beta_{UH\times AGE}=0$,	27.11	0.0000	37.11	0.0000

Graphs 1 and 2 show the earnings streams by educational level for males and females calculated from the regression.

Figure 1.
Earnings by Age and Educational Level, Females

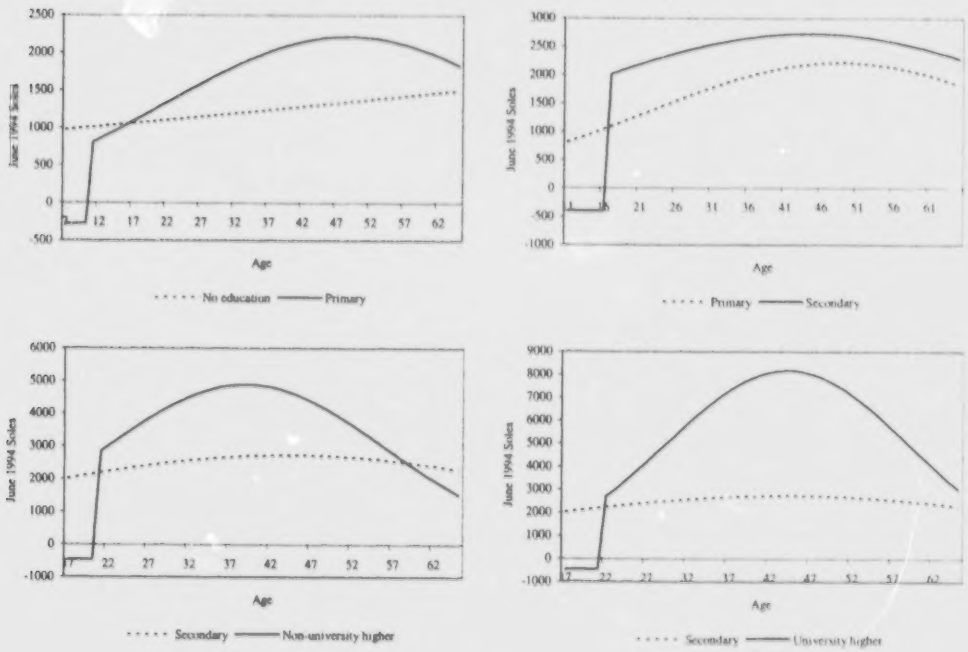

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Figure 2.
Earnings by Age and Educational Level, Males

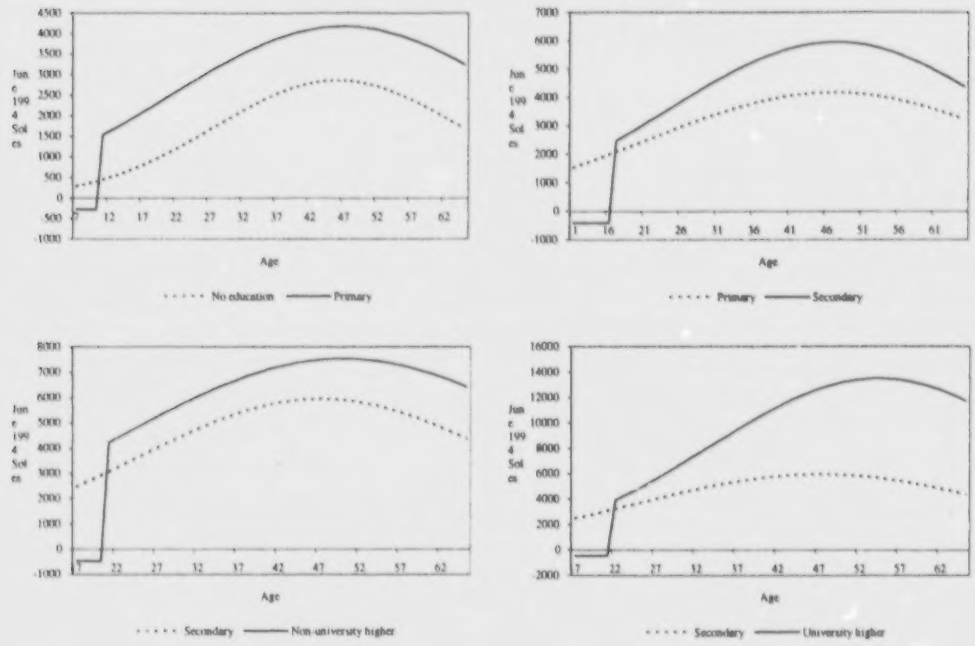

Table 3 shows the regression coefficients used to construct the index of education premium in Chapter 3. The regression with which these coefficients were estimates were Mincerian earnings equations that include cumulative educational dummies, experience and its square, tenure and its square, marital status, gender, if living in Lima, and occupational training.

Table 3.
Estimated Educational Premiums

	1985	1991	1994	1997
Primary/No education	0.418	0.230	0.275	0.427
Secondary/Primary	0.449	0.205	0.274	0.360
Non-university higher/Secondary	0.528	0.237	0.328	0.415
University higher/Secondary	0.581	0.502	0.698	0.864

Background Note 4.
Determinants of Achievement[8]

Analysis of determinants of achievement is an important tool to inform policy choice. This study uses the analytical approach of hierarchical linear modeling to identify the factors affecting math achievement at the levels of students, schools, and departments. The findings cannot be used to evaluate the impact of education policy of the 1990s because of the usually long time lag between intervention and effects on teaching and learning in the classroom.

1. The dataset.

The dataset was drawn from the first national standardized test of mathematics in Grade 4 in 1996 and the accompanying questionnaires. The sample comprised 50,479 students who were selected from a population of 618,719 Fourth Graders in 1,275 schools in 25 departments. Thirty students in each sample school were given the test, which lasted for an hour. The sample included private and public schools but undersampled rural schools. Single-teacher schools in remote areas were excluded; these accounted for 29 percent of all schools in the country and enrolled about 6 percent of the population of Fourth Graders. This sample frame has resulted in a relatively narrow achievement gap between urban and rural areas.

The dependent variable (also known as the outcome variable) relates to performance on the mathematics test. For simplicity, this will be referred to as outcomes or achievement in this Note. The assessment instruments included multiple choice items in sets, natural numbers, fractions, decimals, geometry, and international units and money. Because the answers required were not dependent on interpretation, this outcome measure can be considered a reasonable measure of performance in mathematics. This analysis applied reliability tests[9] and found the instrument reliable. The scores are informative about the relative performance of students compared among themselves.

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[8] The analysis of data was undertaken by Pete Goldschmidt.

[9] The reliability of a test is defined as the consistency of the information, or scores, obtained. Any test occasion will produce some errors of measurement, which are assumed to be random. That is, students taking the same test on different occasions will score slightly differently due to chance errors (e.g. accidentally marking the answer as B, when they mean C). If the analysis entails using the total test score, then what is of concern is whether any individual (or set of) item(s) scores are not related to the overall test score. There are several methods to estimate reliability. A simple method, which highlights what reliability is, is the spilt-half method. The split half method randomly divides the test in half and correlates the two halves. This would yield a reliability coefficient. More commonly, and the method used for this test, is to generate Cronbach's Alpha; which is to correlate all possible scores with n-1 test items (i.e. remove item 1 from the score and correlate to the test with item 2 removed, etc.). The dependent variable in this study has passed these tests.

The independent variables (also known as the predictor or explanatory variables) were mostly drawn from, but not limited to, information collected by three questionnaires which accompanied the math test for the principal of the sample school, the teacher of the subject, and parents of the 30 students who took the test, respectively. The independent variables selected for this analysis are as follows:

- At the student level (also known as level 1), the predictor variables were grouped into four categories: (a) ascriptive characteristics (gender, mother tongue, and student age), (b) availability and usage of text materials, (c) student attendance and study habits, and (d) parental roles and expectations.

- At the school level (also known as level 2), the predictor variables were divided into seven groups: (a) geographic (such as urban and rural, and the coast, mountain, and jungle) , (b) public or private school type, (c) text usage, (d) teacher characteristics, (e) teacher roles, (f) principal characteristics, and (g) parent roles.

- At the department level (also known as level 3), the predictor variables were drawn from four data sources: (a) variables which were aggregated from the student- and school-levels in the 1996 test dataset (such as departmental percentage of private school students, over-aged students, female students, Quechua speaking students, 4th Grade teachers with a Master's degree, and with a title from Institutos Superiores Pedagogicos); (b) government expenditure data on public spending on basic education per student by department in 1994; (c) household survey data on household expenditure on basic education per capita by department in 1994; and (d) FONCODE's 1993 Poverty Map, which provided information on departmental characteristics (such as poverty index, percentage of population in chronic malnutrition, mortality rates, illiteracy rates, and school nonattendance rates).

This dataset has certain *limitations*. First, the assessment was undertaken at a single point in time so it is not possible to control for prior learning. Second, the questionnaires did not contain questions on parental education, number of siblings at home, family socioeconomic status (SES) or resources (e.g. family income or expenditure, type of dwelling, availability of water and electricity, etc.),[10] or school resources (e.g. public spending per student, parental contribution per student, availability of water, electricity, library and laboratory, etc.). In other words, some key predictors were not available to enable controlling for their effects. The only variables that may proxy public and private finance of education were public and private expenditure at the departmental level.

[10] Although the questionnaire contains a question on parental occupation, the inclusion of the housewife category into the list confounded the effects because a large number of mothers checked this category. Therefore, it is not possible to even use occupation as a proxy for SES.

2. Descriptive statistics

In the main text of this report, Table 3 presents the average scores and standard deviation of the mathematics test. The outcome differentials were substantial, particularly between private and public schools, Spanish-speakers and Quechua-speakers, and between the jungle and other regions. The coefficients of variability show large disparity within each subgroup.

Table 1 below presents the mean, standard deviation, minimum and maximum value of variables at the student level. Most of the data were collected from a few questions on students attached to the test and from the questionnaire for parents. Although the original sample had 50,479 students, only 40,766 returned the test, of whom, only 33,233 respondents had all the observations. The most common missing value was gender and type of school attended. Nonetheless, the mean did not change.

In Table 1, the column which shows mean or percentage indicates either the average value of the variable or the percentage share of each categorical variable (for example, girls accounted for 50 percent of the students in the sample). The percentage share of omitted variables, such as boys (which are used for comparison with predictors in the same categories) can be deduced from the percentage share of girls, and its standard deviation can be derived from the formula in the footnote.[11]

Table 1: Descriptive Statistics of Student-Level Variables Used in the HLM Model

	Mean or Percentage	Standard deviation	Minimum	Maximum
Ascriptive characteristics				
Girls (boys omitted)	0.50	0.50	0	1
Aymara	0.03	0.35	0	1
Quechua (Spanish speakers omitted)	0.15	0.16	0	1
Student over the age of 10 for Grade 4	0.23	0.42	0	1
Materials (text books)				
No textbooks	0.15	0.36	0	1
School provided textbooks	0.06	0.24	0	1
Sibling's textbooks (dictated by teacher omitted)	0.21	0.41	0	1
Student attendance & study habits				
Daily attendance (sporadic attendance omitted)	0.07	0.26	0	1
No studying	0.01	0.08	0	1
Studies regularly	0.27	0.44	0	1
Studies for exams	0.16	0.37	0	1
Studies because expected	0.20	0.40	0	1
(Studies because of self-motivation omitted)				

[11] The equation for standard deviation is ((p(1-p))/n)^.5. p is the proportion of 1's; so if the left out category is boys, for example, p for them would be 1-.493 (or it could be done as 100-49.3). ^.5 is the square root. In case of percentage being presented as decimals, the equation would need to be adjusted to 100-p.

Parental expectation, roles & home environment:				
Goal of schooling				
Develop literacy	0.19	0.39	0	1
Develop nothing	0.06	0.24	0	1
Develop comprehensively	0.23	0.42	0	1
Develop math (Learning well in general omitted)	0.13	0.34	0	1
Home academic support				
Environment for studying (through homework omitted)	0.09	0.28	0	1
None	0.22	0.42	0	1
Special education programs	0.01	0.11	0	1
Additional reading	0.19	0.39	0	1
Father assistance (Mother assistance omitted)	0.20	0.40	0	1
No assistance	0.25	0.43	0	1
Other family assistance	0.23	0.42	0	1
Sample size	33,233			

Table 2 presents descriptive statistics of school-level predictors. Some of the variables were aggregrated from the student level (such as the school means of students' accessibility to text), while others were collected from surveys of teachers and principals.

Table 2: Descriptive Statistics of School-Level Variables Used in the HLM Model

	Mean or percentage	Standard deviation	Minimum	Maximum
Geographic				
Rural (urban omitted)	0.19	0.39	0	1
Selva	0.21	0.41	0	1
Sierra (costa omitted)	0.37	0.48	0	1
School type				
Private (public omitted)	0.14	0.35	0	1
Text usage				
No text	15.41	14.93	0	100
School provided text	6.21	8.57	0	77
Siblings and/or other people's text (Teacher's own text omitted)	20.95	13.36	0	100
Teacher characteristics				
Number of years of service	12.17	7.59	1	57
Number of training courses (1990-96)	6.83	2.96	0	11
Teacher language: Aymara (Spanish omitted)	0.01	0.10	0	1
Teacher language: Quechua	0.08	0.27	0	1
Teachers graduated from universities	0.15	0.36	0	1
Teachers graduated from ISP	0.51	0.50	0	1
Teachers graduated from IST	0.01	0.11	0	1
Teachers graduated from professional courses	0.17	0.37	0	1
Professional titles in other specialties	0.01	0.11	0	1
University graduates	0.06	0.23	0	1
University leavers (finished courses without degree)	0.03	0.16	0	1

Table 2. (continued)

	Mean or percentage	Standard deviation	Minimum	Maximum
Secondary school graduates (Secondary leavers with teacher training omitted)	0.00	0.06	0	1
Condition of work (first of class omitted): Titled	0.03	0.18	0	1
Contracted	0.16	0.36	0	1
Teacher roles				
Explain materials	0.11	0.32	0	1
Invite specialized persons*	0.01	0.08	0	1
Student participation (Assess performance omitted)	0.79	0.41	0	1
Principal characteristics (Spanish omitted)				
Principal's language: Aymara	0.01	0.11	0	1
Principal's language: Quechua	0.10	0.30	0	1
Principal's language: Other	0.01	0.09	0	1
Parent roles (according to teachers)				
Check attendance	0.08	0.26	0	1
Check homework	0.21	0.41	0	1
Prepare children for exams	0.05	0.21	0	1
Provide nutrition	0.05	0.21	0	1
Stimulate learning (no participation omitted)	0.26	0.44	0	1
Sample size	1,275			

*The meaning of teacher's role being to invite specialized persons is unclear from the questionnaire.

Table 3 presents the descriptive statistics of departmental-level variables. Some of the variables were aggregrated from the student level (such as percentage of students who are females, or in private schools), while others were collected from surveys of teachers and principals (such as percentage of teachers with various qualifications).

Table 3: Descriptive Statistics of Departmental-Level Variables in the HLM Model

	Mean/ percentage	Standard deviation	Minimum	Maximum
Public expenditure on basic education per student (US$)	141.3	31.4	71.0	223.0
Household expenditure on basic education per capita (US$)	74.5	42.0	17.9	144.0
Poverty index	3.0	1.1	1.0	4.5
Female students	49.3	2.6	44.5	56.5
Over-aged students	23.5	10.1	10.1	42.3
Quechua students	14.8	21.3	0.0	67.5
Private school students	14.8	11.9	0.0	50.0
Teachers with MA degree	12.5	12.6	0.0	44.8
Teachers graduated from ISP	52.1	14.0	27.6	76.5
Teacher years of service	11.9	1.75	8.4	15.7
# of training courses attended	6.8	1.0	4.6	8.3
Sample size	25			

3. The analytical approach of hierarchical linear modeling

The appropriate approach to analyze this dataset is hierarchical linear modeling (HLM). This is because the structure of the data was hierarchical: student-level variables were nested within schools, and in turn, school-level variables were nested within departments. For example, students' accessibility to text materials is an indicator of students' home resource; but when it is aggregated to the school level, it became an indicator of school resource and the normative environment (Bryk and Raudenbush, 1992). Mixing individual and aggregated explanatory variables can lead to both statistical and substantive errors in interpretation of the effects of the group, such as the school or the department (Aitkin and Longford, 1986; Burstein, 1980).

Group effects are truly important because students with the same characteristics might have different learning outcomes if they attend schools with different organization, quality, policies, and practices or if they live in different departments (Akin and Garfinkel, 1977). For this reason, the Ordinary Least Square (OLS) regression analysis cannot be applied to this dataset because it does not take into account the hierarchical structure of the data. If the variance in test scores attributable to differences between schools is large, OLS regression analysis will severely understate standard errors and overestimate their significance, thereby leading to falsely rejecting the null hypothesis. However, hierarchical linear modeling (HLM) allows personal and contextual (such as school and department) effects on an individual's score to be analyzed (Bryk and Raudenbush, 1992).

Unconditional models. The first step in HLM was to estimate the fully unconditional models, which can be at two levels (students and schools) or three levels (students, schools, and departments). The unconditional models for three-level analysis in this study are as follows:

$$Y_{ijk} = \pi_{0jk} + e_{ijk},\ e_{ijk} \sim N(0, \sigma^2). \qquad \text{(Equation 1)} \qquad \text{(Level 1)}$$

$$\pi_{0jk} = \beta_{00k} + r_{ojk},\ r_{ojk} \sim N(0, \tau_{0k}). \qquad \text{(Equation 2)} \qquad \text{(Level 2)}$$

$$\beta_{00k} = \gamma_{000} + u_{00k},\ u_{00k} \sim N(0, \tau_{00}). \qquad \text{(Equation 3)} \qquad \text{(Level 3)}$$

where Y_{ijk} was math test score for student i in school j in department k; π_{0jk} was the mean test score at school j in department k; β_{00k} was the departmental mean of the test score in department k, and γ_{000} was the grand mean of the math test score. The e_{ijk} was the student-level random components in school j in department k; the r_{ojk} was the school-level random components in school j in department k; and u_{00k} was the departmental-level random component in department k. The σ^2 was the error term (residual) of the variance in test scores between students; the τ_{0k} was the error term of the total variance in test scores between schools, and the τ_{00} was the error term of the total variance in test scores between departments.

This unconditional model allowed for the calculation of the intraclass correlation. This provided estimates of (a) the total variance in test scores between students (within schools), (b) the total variance in test scores between schools (within departments), and (c) the total variance in test scores between departments:

$$\rho = \sigma^2/(\tau_{0k} + \tau_{00} + \sigma^2) \quad \text{(Equation 4)} \qquad \text{(Level 1, between students)}$$

$$\rho = \tau_{0k}/(\tau_{0k} + \tau_{00} + \sigma^2) \quad \text{(Equation 5)} \qquad \text{(Level 2, between schools)}$$

$$\rho = \tau_{00}/(\tau_{0k} + \tau_{00} + \sigma^2) \quad \text{(Equation 6)} \qquad \text{(Level 3, between departments)}$$

where ρ was the intraclass correlation, and the error terms (residuals) of the variance on the right side have been described in Equations 1, 2, and 3. Subsequently, the unconditional estimates of the errors in Equations 1, 2, and 3 provided the basis for computing the proportion of variance in test scores explained by additional variables at each of the three levels. It should be noted that HLM does not generate R-squared statistics. The explanatory power of a model is indicated by how much of the proportion of variance in outcome it can explain.

Conditional models. The next step was to specify a conditional model with random effects analysis of covariance (ANCOVA) for each of the three levels. At level 1, the model used student-level variables, and allowed the intercept and slopes to vary across schools and departments. The model was as follows:

$$Y_{ijk} = \pi_{0jk} + \pi_{1jk}(X_{ijk} - X_{.jk}) + e_{ijk},\ e_{ijk} \sim N(0, \sigma^2) \quad \text{(Equation 7)} \quad \text{(Level 1)}$$

where X's were background characteristics of student i (such as girls, over-aged, and Quechua speakers) in school j and department k; and e_{ijk} was the student-level random effect. The intercept term of the conditional model was similar to that in the unconditional model, except that the mean was now adjusted for the covariates (student-level variables). In this case, X's were centered on the school mean (the average value of a given variable of school j).[12] Centering allowed π_{0jk} to be interpreted as the mean of school j in department k for test score of student i in the same school, adjusted for differences among schools in student characteristics. In this manner, differences in student characteristics could be taken into account.

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[12] For example, if there is a continuous variable for the number of hours of studying per week, this could be centered around the mean hours of studying per week at school j, thereby adjusting for the time of students actually studying. One advantage of school-mean centering all the variables is to easily identify the marginal effect of any single predictor, after controlling for the effects of other covariates. This would allow addressing the question of: if a student is an average in all respects at school j, what is the marginal effect of hours studying? For categorical variables, group-mean centering works in the same manner. At levels 2 and 3, grand-mean centering refers to the same procedure and effect.

Unlike OLS regression coefficients, the intercept and slope parameters were subscripted by j and k, indicating that each school could have a different intercept and slope(s). The student-level coefficients, π_{jk}, could be specified as being either fixed, non-randomly varying, or randomly varying (Bryk and Raudenbush, 1992). A model with several student-level predictors could have any combination of the three specifications.

If there is significant variation in intercepts and slopes between schools, then this can be modeled by including predictors at the school and student levels aggregated to the mean of school j. Thus the student-level intercepts and slopes became outcomes, and the school-level ANCOVA model was as follows:

$$\pi_{0jk} = \beta_{00k} + \beta_{01k}(W_{.j} - W_{..}) + r_{0jk},\ r_{0jk} \sim N(0, \tau_{00})$$
$$\pi_{1jk} = \beta_{10k} + \beta_{11k}(W_{.j} - W_{..}) + r_{1jk},\ r_{1jk} \sim N(0, \tau_{11}) \quad \text{(Equation 8)} \quad \text{(Level 2)}$$

where W's were school characteristics (for example, the average years of service of teachers in a school); r_{0jk} was the school-level random effect; and β_{10} was the pooled within-school regression coefficient. The W's were centered on the grand mean (see the same footnote on mean-centering). The intercept and slope were modeled to vary randomly and to be affected by a characteristic, W, of school j. The interpretation of π_{0jk} would be how the adjusted school means of the outcome, Y, were affected by the school characteristics W's, given student characteristics, X's. Similarly, the slope coefficient could be described as being affected by W's, given X's.

If there was significant variation in intercepts and slopes between departments, then this could be modeled by including department-level predictors, as well as school- and student-level predictors aggregated to the mean of department k. Thus the school- and student-level intercepts and slopes became outcomes. The department-level ANCOVA model was as follows:

$$\beta_{00k} = \gamma_{000} + \gamma_{001}(Z_{.k} - Z_{...}) + u_{00k},\ u_{00k} \sim N(0, \tau_{00})$$
$$\beta_{10k} = \gamma_{100} + \gamma_{110}(Z_{.k} - Z_{...}) + u_{00k},\ u_{00k} \sim N(0, \tau_{00}) \quad \text{(Equation 9)} \quad \text{(Level 3)}$$

where Z's were department characteristics (for example, the poverty index). The Z's were centered on the grand mean (see the same footnote on centering). The intercept and slope were modeled to vary randomly and be affected by a characteristic, Z, of department k. The interpretation of β_{00k} would be how the adjusted departmental mean of the test score were affected by the departmental characteristics Z's, given both student characteristics, X's, and school characteristics, W's. Similarly, the slope coefficient can be described as being affected by Z's, given X's and W's.

In cases where student-level effects varied much between schools and departments, the next step was to analyze whether school and department variables have effects on student-level variables. This was known as the cross-level model.

At level 2, using information from the unconditional and the conditional models, the proportion of the variation in the π's is explained by the school-level variables. For example, the proportion of the variation of π_1 would be computed as follows:

$$[\tau 11(\text{unconditional}) - \tau 11(\text{conditional})]/\tau 11(\text{unconditional}) \quad \text{(Equation 10)}$$

Additionally, a χ^2 test could be used to test whether the error (residual) variation τ_{cc} was significant; in which case additional variation in π_c was left to be explained. This indicated that the relationship between the outcome and the student-level predictor varies significantly from school to school, even when controlling for the school-level variables modeling that particular coefficient.

Similarly, at level 3, the proportion of variation in the βs can be explained by department-level variables and can also be determined by Equation 10, using the error variances at level 3. As with the level 2 analysis, the relationship between the outcome and department variables could be examined by using a χ^2 test to determine whether the school level predictor continued to vary from department to department after controlling for department-level variables.

4. Two-level analysis (student and school)

The analysis began with the student and school levels in order to explore in depth the effects of variables at these two levels on mathematics outcomes. The approach was guided by four questions: (a) What were the marginal effects of various student characteristics on average student performance, after controlling for other covariates in the student-level model? (b) What were the marginal effects of school characteristics on average school outcomes, after controlling for other covariates in the school-level model? (c) What were the cross-level effects? In other words, what were the effects on a student who attended a particular school, after controlling for individual characteristics? (d) What proportion of variance in outcomes was attributable to differences between students (within schools) and between schools?

(a) Effects of student characteristics on average student outcomes (Level 1 model)

Table 4 shows the marginal effects of each of the above described student characteristics, controlling for other covariates in the model (see Equation 7 for the model).[13] When other concomitant variables were held constant, girls tended to do worse than boys. Students over the age of 10 performed significantly worse than younger children. This comes as no surprise because over-aged students tend to be repeaters. To a lesser extent than gender and age, the mother tongue also had an effect, but it was confined to Quechua speakers who did less well than Spanish speakers. There was no statistically significant difference in the outcomes of Aymara speakers and Spanish speakers. For policy research, it is important to identify the variables that enable Aymara speakers to perform so much better than other indigenous groups.

[13] This model did not control for school-level variables.

Table 4: Effects of Student Characteristics on Student Outcomes

	Coefficient	Standard error
Intercept	45.1	0.45
Ascriptive characteristics		
Girls (compared with boys)	-3.58 *	0.21
Mother tongue Aymara (compared with Spanish speakers)	-0.65	0.71
Mother tongue Quechua (compared w/ Spanish speakers)	-0.70 *	0.35
Student over the age of 10 for grade 4	-1.84 *	0.22
Text usage (compared with teachers' own text)		
No text	-0.69 *	0.26
School provided text	-0.38	0.36
Siblings' and/or others' text	-0.06	0.22
Student attendance & study habits		
Daily attendance (compared with sporadic attendance)	1.62 *	0.33
No studying (compared with study because of self-motivation)	-2.71 *	0.98
Study regularly (compared with self-motivation)	-1.69 *	0.21
Study for exams (compared with self-motivation)	-2.80 *	0.25
Study because expected (compared with self-motivation)	-3.87 *	0.24
Parental expectations of school (compared with general learning)		
Develop literacy	-1.13 *	0.23
Develop nothing	-1.98 *	0.37
Develop comprehensively	0.42	0.23
Develop mathematics	1.09 *	0.26
Home academic support		
Provide environment for studying (compared with provide support through homework)	0.46	0.31
Provide no support	-0.22	0.22
Special education programs	-0.74	0.75
Provide additional reading	1.06 *	0.23
Father assistance (compared with mother's assistance)	0.31	0.24
No assistance	0.86 *	0.23
Other family assistance	-0.70 *	0.23

* p <=.05

Student attendance and study habits mattered. Students who attended school daily did better than those who attended sporadically. Motivation was important. Students who undertook their study because they were motivated had higher scores than students who studied for other reasons.

Parental roles and expectations also affected achievement. Parents who expected school to develop mathematics skills saw their children performing better in math, compared to parents who expected schools to develop literacy, generally, or nothing. Interestingly, home academic support mattered only when parents provided additional reading

material, not simply through providing a general environment for studying, or through help with homework or other special programs. The assistance of mothers and other family members turned out not to be helpful in this sample. One might speculate as to whether this is due to lower educational level of mothers and other family members.

(b) Effects of school characteristics on school mean (Level 2 model)

Table 5 presents the marginal effects of each of the above described school characteristics, controlling for other covariates in the model[14] (See Equation 8 for the model). Holding other concomitant variables constant, rural and urban areas had no statistically different effects on achievement, but geographic region had big effects. Schools in the mountain region performed less well than those on the coast, whereas the jungle region did much worse than the coast. Students in private schools were associated with much higher achievement. The nonavailability of textbooks was negatively associated with learning outcomes. Schools with 50 percent or more of students who had no textbook, or who used their siblings' textbooks, did worse than those whose text was based on dictation by teachers.

Teachers who had more years of service had a positive impact on student achievement, but in-service training did not. This, however, changed in a 3-level analysis. In this two-level analysis, there was also no statistically significant difference between teachers of various academic qualifications, conditions of service, and in-service (but this is not true in a three-level analysis). This may be because there is insufficient variance between schools in these variables to show the difference, but once aggregated to the departmental level, the difference has statistical significance.

A more disturbing finding is that teachers whose mother tongue was Quechua were associated negatively with student math achievement, in comparison with teachers whose mother tongue was Spanish, but this was not true for teachers whose mother tongue was Aymara. Principals' characteristics also mirrored those of teachers. Even after controlling for students' mother tongue, Quechua speaking teachers were associated negatively with math performance. This may be due to Quechua speaking teachers being less prepared, and calls for special attention to the training of Quechua speaking teachers. That Aymara speaking teachers were indistinguishable from Spanish speaking teachers in terms of their impact on achievement disproves the notion that indigenous teachers are not effective. It also poses a very important research question as to why Aymara students and teachers were doing so much better than other indigenous groups. If the variables that enable them to overcome their disadvantage can be identified, they might also be used to help other indigenous peoples.

Teachers' perception of their role made a difference. If teachers perceived that their role was to assess and improve performance, they had large positive effects on achievement, in contrast to those who considered their role simply to explain materials, invite guests, and encourage student participation. This seemed to indicate that focusing on outcomes produced the desired results.

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[14] This model did not control for student-level variables.

Table 5: Effects of School Characteristics on School Mean

	Coefficient	Standard error
Intercept	45.10	0.37
Geographic		
Rural (compared with urban)	-1.84	1.04
Selva (compared with costa)	-5.65 *	1.07
Sierra (compared with costa)	-2.77 *	0.92
School type		
Private (compared with public)	12.71 *	1.24
Text usage (compared with teacher's own text)		
Difference between % of student at school with (1):		
No text	-0.18 *	0.03
School provided text	-0.07	0.05
Sibling's and/or other's text	-0.13 *	0.03
Teacher characteristics		
Number of years of service	0.14 *	0.06
Number of training courses taken (between 1990-96)	0.14	0.13
Mother tongue: Aymara (compared with Spanish)	-0.85	3.83
Mother tongue: Quechua	-5.17 *	1.51
University graduates with teacher's title (compared with secondary school leavers with teacher training only)	3.39	1.90
ISP graduates with teacher's title	1.69	1.67
IST graduates with teacher's title	2.43	3.80
Graduated from professional courses	0.62	1.82
Professional titles in other specialties	-0.94	3.83
University graduates without teacher's title	2.61	2.22
University leavers who finished courses but had no degree	-1.11	2.79
Appointed by manager (compared w/ officially appointed)	-1.84	2.12
Contract	-0.36	1.14
Teacher roles		
Explain materials (compared with focusing on learning outcomes by assessing performance)	-4.36 *	1.69
Invite specialized persons (2)	-9.50 *	4.71
Encourage student participation	-3.48 *	1.31
Principal characteristics		
Mother tongue is Aymara (compared with Spanish)	6.78	3.62
Mother tongue is Quechua	-4.44 *	1.38
Mother tongue is other languages	-2.22	4.20
Parent roles (according to teachers)		
Check attendance (compared with no participation)	3.97 *	1.51
Check homework	3.05 *	1.06
Prepare children for exams	7.58 *	1.90
Provide nutrition	3.24	1.86
Stimulate learning	5.30 *	1.01

Notes: (1) Percent in 00.0% (i.e. to calculate the effect at 50%, the coefficient is multiplied by 50).

(2) The meaning of teacher's role being to invite specialized persons is unclear from the questionnaire.

* $p <= .05$

Parental role *as perceived by teachers* was also important. Parents who checked attendance and homework, prepared children for exams, and stimulated learning had children who performed significantly better than those parents who did not participate in their children's education. This might be an indicator that proactive teachers who tried to get parents more involved and communicate more have positive effects on children. At the school-level, this variable might be a proxy of community support.

(c) Cross-level effects of school characteristics on achievement slopes

This analysis examines whether or not the effects of student characteristics varied across school. In other words, were there school-level factors that had mitigated the student-level effects? Ascriptive characteristics of students, accessibility of text, study habit, parental role and expectations, and home academic support were crossed with geographic variables of school location, availability of text, and other school characteristics such as private schools, teacher in-service training, and years of service. Only the coefficients and the standard errors of the group of variables which have statistical significance in some of them are presented in Table 6. Those which has no significance at all were not recorded, leaving blank spaces in the table to make it easier to read.

Table 6 shows that although girls in general performed less well than boys, those in the jungle and mountain regions did better relative to girls on the coast. Girls also did slightly better when schools provided the text. There was no significant difference in math achievement between boys and girls in the rural and urban areas, or in private and public schools.

Overaged students performed worse in general and far worse in private schools, relative to achievement of overaged students in public schools. This might be attributable to a more competitive environment in private schools that did not help overaged students to catch up.

With respect to the mother tongue of students, there was no significant difference in math achievement between Aymara and Spanish speakers, whether they were in private or public schools. Quechua speakers, however, not only performed less well than Spanish speakers in general, they performed significantly worse in private schools, relative to their performance in public schools.

With respect to study habits, students did better when they were self-motivated to study than if they studied because they were expected to. This had a greater effect than the replies on whether they studied only for exams, studied regularly, or did not study at all. However, students in the rural areas performed better if they studied because they were expected to. In private schools, students who did not study performed significantly worse. In fact, the biggest negative effect was found among private school students who did not study, relative to the performance of students who did not study in public schools. It might be because private schools have much higher expectations for studying hard and those who did not study fell behind.

Home academic support had positive effects on achievement only when the home provided additional reading material. The effect of additional student reading was strengthened when teachers had in-service training.

If parental expectation was to develop math skills, versus general learning, there was a positive effect on math achievement. If it focused instead on other goals, such as developing literacy, comprehensive development, or lacked any definite goal, it did not produce higher math scores. However, in rural areas, even if the expectation was to develop literacy, there was a positive effect on math scores; but if the goal was to develop nothing in rural schools, the negative effect was washed out, possibly because it did not matter what the expectations were.

No text was worse than having teachers' dictated notes. But the years of service negatively impacted on the effects of school-provided texts. The reason was unclear.

In summary, the analysis of cross-level effects confirmed some common sense notions. For example, in private schools, students who did not study, were not high achievers in general (those over-aged and Quechua speakers), and those who were not self-motivated did significantly worse than their counterparts in public schools. At the same time, the analysis also revealed many puzzles that require further investigation. For example, why were girls in the sierra and selva doing better, relative to boys, than girls in the costa? Why did Quechua speakers perform worse in private schools than public schools? The greatest puzzle of all is perhaps why experienced teachers were associated with higher math scores, but the score decreased when they could not use their own text and had to use school-provided texts? Could the school-provided text proxy a new curriculum which experienced teachers are less prepared to teach? Answers to these puzzles might help policymakers design more effective interventions.

(d) Within-school and between-school variance in outcomes

Applying Equations 1, 2, 4, and 5 to the unconditional models, it was found that some 54 percent of the variance in math achievement was attributable to between-school differences, while 46 percent was attributable to within-school differences (between students) (Table 7). The higher the between-school variance, the more inequality among schools there is. Normally, a 30 percent difference in variance is the cutoff point for identifying serious equity problems (See Appendices 5.1 and 5.2).

Student-level variables explained only 4.7 percent of the within-school variance in outcomes. 2.9 percent of the variance was explained by ascriptive characteristics, 0.1 percent by the availability of and usage of texts, 1.2 percent by student attendance and study habits, and 0.5 percent by parental roles.

Between-school variables cumulatively explained 34.2 percent of the variance in outcomes—9.5 percent by geographic factors, 9.5 percent by text usage and homework assignments, 11.6 percent by teachers' characteristics, 0.7 percent by teachers' roles, 1 percent by principals' characteristics, and 1.9 percent by parental roles.

Table 6: Cross-Level Effects of School Characteristics on Mathematics Achievement Slopes

			Geographic							Text provided by						School characteristics					
	Mean		Rural		Selva		Sierra		Sibling		School		None		Private school		In-ser. training		Yrs. of service	
Difference between	Effect		Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
A Girls and boys	-3.61	*	0.21	0.69	0.53	1.26 *	0.55	1.14 *	0.48	0.02	0.02	0.05 *	0.02	0.03 *	0.01	-0.53	0.68				
B Student over age for grade (1)	-2.15	*	0.26													-2.72 *	1.26				
C Aymara and Spanish	0.95		0.73													3.94	2.60				
D Quechua and Spanish	-1.03	*	0.36													-4.28 *	1.37				
E No studying vs. self motivated	-3.14	*	1.04	-0.76	2.22											-8.99 *	4.01				
F Studies regularly vs. self-motivated	-1.71	*	0.21	-0.22	0.59											-2.26 *	0.58				
G Studies for exams vs. self-motivation	-2.78	*	0.25	1.27	0.68											-2.04 *	0.74				
H Studies because expected vs. self-motivated	-4.02	*	0.24	2.08 *	0.60											-3.44 *	0.78				
I Environment for study vs. through homework	0.47		0.31															0.18	0.10		
J None vs. through homework	-0.20		0.22															0.06	0.07		
K Special education prigrams vs. through homework	-0.71		0.75															0.11	0.26		
L Additional reading vs. through homework	1.02	*	0.23															0.16 *	0.08		
M Develop literacy vs. learning well, in general	-1.10	*	0.23	1.87 *	0.60													-0.13	0.08	0.11 *	0.03
N Develop nothing vs. learning well, in general	-2.01	*	0.38	2.08 *	0.94													-0.06	0.13	0.00	0.05
O Develop comprehensively vs. learning well, in general	0.43		0.23	0.98	0.64													0.04	0.08	0.01	0.03
P Develop mathematics vs. learning well, in general	1.06	*	0.26	-0.42	0.72													0.18 *	0.09	0.01	0.03
Q No text versus teacher dictated text	-0.69	*	0.26																	0.02	0.04
R School provided text versus teacher dictated text	-0.45		0.36																	-0.13 *	0.05
S Sibling text versus teacher dictated text	-0.08		0.22																	-0.05	0.03

* $p < 0.05$

Table 7: Extent to which Variation in Mathematics Achievement Is Accounted for by Student-Level Characteristics and the Variation in True School Mean Mathematics Achievement Is Accounted for by School-Level Factors

	Mean		S.E.				
True school mean mathematics achievement	45.1 *		0.46				
Random effects ANOVA							
Level –1 (between students) (rij)	216.5						
Level –2 (between schools) (U0)	258.3						
Amount of variation in mathematics achievement attributable to schools				54.4%			
Variation in true school mean mathematics achievement between schools							
	+ 1sd		61.19				
	- 1sd		29.05				
Within-school variables (1)	Var(rij)	(2)	Cumulative Variance Explained	var(U0)	(2)	Cumulative Variance Explained	Change Signif.
1) Ascriptive chars	210.2 *		2.9%				*
2) Materials (texts)	210.1 *		3.0%				*
3) Student attendance & study habits	207.4 *		4.2%				*
4) Parental roles and expectations	206.4 *		4.7%				*
Between-school variables (1)							
5) Geographic				233.9 *		9.5%	*
6) Text usage				209.2 *		19.0%	*
7) Teacher characteristics				178.5 *		30.9%	*
8) Teacher roles				177.5 *		31.3%	*
9) Principal characteristics				175.0 *		32.3%	*
10) Parent roles				169.5 *	(3)	34.4%	*

Notes:

(1) School-level (level-2) variables model the intercept only.

(2) Indicates whether the variance varies significantly after variables are included in model.

(3) The slope for "Gender" was the only one that had significant between-school variation after including level 2 variables

* P<= 05.

It should be noted that the relative weights of these variables reflected the way the questions for principals, teachers, and parents were structured. A lot of the questions aimed at getting the perceptions of these stakeholders, rather than constructing measurable variables to capture the full impact of student attendance and study habits, parental roles, teachers' role, and principals' characteristics. For example, instead of asking how many days in the preceding week the student attended school, the question only asked whether the parent thought that the student attend regularly. These findings point to ways that future questionnaires could be improved.

In spite of the limitations, the analysis of determinants of achievement has policy implications. It found that textbook availability, homework assignments, and teachers' characteristics and roles had effects on achievement. Since all of these variables are amenable to policy intervention, these call for concerted efforts in textbook provision and teacher training, particularly for Quechua teachers, in order to improve learning outcomes.

5. Three-level analysis (students, schools, and departments).

From the perspective of national educational policy, inequality in learning outcomes among departments is a serious concern. Since the Educational Directorates of the departments are responsible for delivery of education, identifying the determinants of variance in test scores at the department level is a requisite to addressing the issue. Because the 1996 assessment data are not in the public domain, this analysis is unable to report department-specific results.

The three-level analysis was guided by several questions: (a) What were the marginal effects of departmental characteristics on average departmental test score, after controlling for other covariates in the departmental-level model? (b) How much did school-level factors vary across departments, and how much did student-level factors vary across schools and departments? In other words, did some departments do a better job on student achievement, after controlling for school-level, and student level, characteristics? (c) What was the proportion of variance in test scores attributable to differences between students, between schools, and between departments? The following paragraphs address these questions.

(a) Effects of departmental characteristics on departmental outcomes (level 3 model)

In the Main Report, Figures 24 and 25 in Chapter 3 show the relationship between public and household expenditure by department and test scores by department, respectively. This raised the question of whether these two variables merely captured the effects of other variables. Since the issue of education finance has important policy implications, it is imperative to disentangle the effects of other variables from the expenditure variables.

The level 3 analysis began by examining the correlation among the variables at the departmental level. Because of the very high correlation between poverty index, percentage of rural population, chronic malnutrition, mortality rates, illiteracy rates, and school nonattendance, only the poverty index was selected to proxy SES at the departmental level to avoid the problem of multicolinearity (Table 8).

There were still four potential problems in analyzing the relationship between test scores and departmental level inputs. These problems did not permit the use of OLS regression, but could be partially addressed by using HLM:

- *Limited degrees of freedom*: Given that there are only 25 departments, only a small number of predictors could be used. By applying HLM, the variation in student test scores was divided into three components: among students, among schools, and among departments. Only departmental variables were used to explain the variation in test scores between departments.

- *Lack of variability in (and similarity of) departmental measures*: Several of the departmental variables were highly correlated. This problem was addressed by centering the predictor variables. At the student level, the independent variables were centered on the school mean; at the school and the departmental levels, the independent variables were centered on the grand mean. This centering reduced multicolinearity and eased interpretation of results.

- *Ecological fallacy*: This existed when group-level predictors were used to make inferences about individual effects. Using HLM explicitly took the nested nature into account, without ignoring the within-school and within-department variability of test scores.

- *Errors in interpreting the effects of departmental variables on individual student test scores*: HLM enabled interpretation of analyses that simultaneously examined variables at different levels. School- and department-level independent variables identified in what context the effects of student-level independent variables manifested themselves. Or, school- and department-level variables explained some of the heterogeneity among schools and departments in specific student-level effects.

Table 9 presents 11 models which show the marginal effects of additional predictors at the departmental level on the mean of other existing predictors in the model (Equation 9). The major findings are as follows:

Public and household expenditure per student by department together explained about 49 percent of the between-department variance in outcomes (Model 1). However, household expenditure per capita by department has a high level of statistical significance, but not public expenditure. This finding was consistent with that observed in Figures 24 and 25. The lack of statistical significance for the interaction terms between public and private expenditure per student indicated that public and private expenditures did not substitute for each other (Model 2).

Although poverty index has statistical significance, it only explained 18 percent of the variance in test scores (Model 3). Even when poverty index was combined with public and household expenditure, household expenditure per student is the only variable with statistical significance in predicting math test scores (Model 5). Meanwhile, these combined variables explained over half of the variance of test scores between departments.

To have more precise measure, departments were divided into the categories of nonpoor, average, poor, and extremely poor (Model 4). They were combined with public and household expenditure (Model 6). The results in these two models were similar to the above two, respectively. However, when interaction terms were created between poverty and household expenditure per capita, in extremely poor departments household expenditure alleviated the negative effects of poverty on test scores (Model 7).

When the percentage of students in private schools in the department was taken into consideration, the statistical significance of household expenditure disappeared. In extremely poor departments, however, household expenditure still alleviated the negative effects of poverty on test scores (Model 8).

Table 8: Correlation Matrix

Correlations	EXPPRIV	EXPPUBLC	OLDERKD3	QUECHUA3	TCHEMA3	TCHENI3	SRVCSYR3	TCHRTRN3	RURALP3	PCTRURAL	Poverty index	PCTMALNR	MORTRATE	ILITRATE	SCHLNOAT	P1	P2	P3	P4	MATH SScore
Household expenditure per capita by dept	**1.00**																			
Public expenditure per student by dept.	0.04	**1.00**																		
% of over-aged students in dept.	-0.73	-0.33	**1.00**																	
% of Quechua students in dept.	-0.45	-0.21	0.51	**1.00**																
% of teachers from university in dept.	0.46	0.04	-0.47	-0.12	**1.00**															
% of teachers from ISP in dept.	-0.25	0.26	0.13	0.12	-0.45	**1.00**														
% of teachers with long service in dept.	0.25	-0.07	-0.30	-0.22	0.20	-0.06	**1.00**													
% of teachers with training in dept.	0.46	0.19	-0.50	0.06	0.51	-0.20	0.12	**1.00**												
% of rural students in dept	-0.40	0.03	0.32	0.10	-0.26	0.06	-0.22	-0.23	**1.00**											
% of rural population in dept.	-0.63	-0.33	0.58	0.41	-0.53	0.19	-0.25	-0.58	0.42	**1.00**										
Poverty index in dept	-0.73	-0.26	0.63	0.62	-0.26	0.14	-0.07	-0.39	0.41	0.77	**1.00**									
% of malnutrition in dept.	-0.69	-0.42	0.75	0.49	-0.43	-0.04	-0.21	-0.54	0.48	0.85	0.85	**1.00**								
% of mortality in dept.	-0.77	-0.18	0.71	0.70	-0.46	0.17	-0.21	-0.41	0.45	0.80	0.87	0.85	**1.00**							
Illiteracy rate in dept.	-0.63	-0.39	0.75	0.78	-0.35	0.25	-0.17	-0.33	0.34	0.73	0.87	0.81	0.82	**1.00**						
School nonattendance rates in dept.	-0.60	-0.39	0.78	0.34	-0.52	0.04	-0.09	-0.63	0.26	0.72	0.74	0.84	0.73	0.73	**1.00**					
Nonpoor department (P1)	0.30	0.05	-0.27	-0.20	0.25	-0.07	0.01	0.09	-0.29	-0.54	-0.63	-0.56	-0.51	-0.44	-0.49	**1.00**				
Average department (P2)	0.49	0.32	-0.42	-0.30	0.09	0.13	0.02	0.41	-0.19	-0.38	-0.50	-0.48	-0.42	-0.50	-0.44	-0.25	**1.00**			
Poor department (P3)	-0.19	-0.21	0.15	-0.28	-0.30	-0.29	0.18	-0.33	-0.01	0.29	0.22	0.34	0.11	0.07	0.42	-0.23	-0.43	**1.00**		
Extremely poor department (P4)	-0.54	-0.16	0.48	0.74	0.02	0.21	-0.20	-0.16	0.42	0.50	0.75	0.56	0.70	0.77	0.39	-0.23	-0.43	-0.39	**1.00**	
Math test scores	0.60	-0.02	-0.63	-0.52	0.49	0.03	0.29	0.12	-0.03	-0.32	-0.32	-0.42	-0.53	-0.37	-0.44	0.16	0.15	-0.04	-0.22	**1.00**

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Table 9: Effects of Departmental Characteristics on the Grand Mean of Math Test Scores

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
Intercept	44.5****	44.46****	44.43****	44.50****	44.5****	44.2****	44.47****	44.62****	44.57****	44.72****	44.44****
Public expenditure per student	-0.02	0.5			0.01	0.02	-0.06	-0.03	-0.01	-0.04	-0.05
Household expenditure per capita	0.12****	0.21			0.16***	0.16****	0.17****	0.09	0.10**	-0.05	0.06
Interaction of public & private expenditure		0									
Poverty index			-2.65		1.83						
Nonpoor dept. (Poverty index 1)				1.44		0.01	9.36	-5.69	-2.45	-2.60	-1.60
Poor dept. (Poverty index 3)				-3.16		3.53	14.74	8.61	1.89	0.57	4.05
Extremely poor dept. (Poverty index 4)				-5.35		5.21	-11.91	-10.49	9.32*	7.18*	6.42*
(Average poverty index 2 omitted)											
Poverty 1 * Household expenditure p. c.							-0.09	0.03			
Poverty 3 * Household expenditure p. c.							-0.2	-0.12			
Poverty 4 * Household Expenditure p. c.							0.41*	0.3*			
(Poverty 2 omitted)											
% of private school students in dept.								0.31*	0.27*	0.18*	0.18*
% of Quechua students in dept.									-0.2***	-0.15**	-0.14*
% of female students in dept.										-0.63*	-0.66*
% of over-aged students in dept.										-0.39***	-0.30**
% of teachers from university in dept.											0.19*
% of teachers from ISP in dept.											0.20*
Degree of freedom	22	21	23	21	21	19	16	15	17	15	13
Variance of Tau (random model)	28.79	27.93	45.55	48.9	27.42	26.96	18.85	13.5	10.56	4.19	3.44
% of between dept. variance in test scores explained	48.50%	50.00%	18.40%	12.52%	51.00%	51.77%	66.28%	75.85%	81%	93%	94%

Key: **** p<=0.0001; ***p<=0.001; **p<=0.01; *p<=0.05

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After adding the percentage of Quechua speaking students in departments, while the percentage of private school enrollment was retained, the effects of poverty in extremely poor departments changed from negative to positive sign. This signaled that students in high poverty departments are doing marginally better once the effects of private schools and the proportion of Quechua students were controlled for (Model 9). The effects of Quechua speakers remained after the percentage of girls and the percentage of over-aged students were added (Model 10).

When the proportion of teachers graduated from universities and teachers trained in Institutos Superiores Pedagógicos (ISPs) were added, the effects of poverty remained. However, teacher's pre-service education played a significant role—when departments had a higher proportion of well-educated and well-trained teachers, departmental average test scores was higher. It should be noted, though, that teachers graduated from universities did not enhance the achievement of Grade 4th students more than teachers who graduated from ISPs. Students in extremely poor departments performed marginally better after all of these variables were controlled for. The interpretation of this is that if an average student attended a school that was similar to all other schools in the country on average, and if the department in which this school was located only differed from other departments in its poverty level (i.e. extremely poor), this student would be expected to outperform another average student in another department, that only differed by the poverty level.

Given the very small degree of freedom left by the full departmental model (Model 11), in spite of the very large reduction in the percentage of between-department variation in mathematics test scores, the equivalent of the R-squared statistics[15] is reduced by approximately 3 to 15 points, depending on both the number of predictors in the model. For social science, this is very respectable.

(b) Final 3-level model with interaction

The 3-level model attempts to identify factors that accounted for variations in mathematics achievement at the levels of students, schools, and departments simultaneously. Since the 2-level analysis had examined in details the determinants of achievement at the student and school levels, this final model focused mainly on the levels of schools and departments. This final model did not use the entire set of level-one predictors due to limitations with the data (the extremely large number of categorical variables). Including all of the potential predictors would make it very difficult computationally to generate estimates. It also would muddle the results when the focus is on departments and schools because so many parameter estimates are unyielding to sort through, and lose meaning when too many extraneous variables are included. It is important to consider the correlation among variables included and excluded in the model; if excluded variables act as significant mediators or moderators between included variables and mathematics achievement, it would be improper to exclude these variables. The student level predictors used in this final model are not affected by those variables excluded from the model.

[15] While the interpretation is roughly the same, what is normally referred to "R-squared" is not technically what is calculated.

It may be convenient to consider a student's mathematics score as a combination of a mean score, plus some deviation. This deviation can be broken into the student, school, and department components. The mean is itself a function of a grand mean plus school and department level variations. For example, the mean for Lima is equal to the grand (national) mean plus some variaton. Further, a student's individual score is some function of the grand mean plus the deviation associated with attending a particular school in a particular department *plus* effects due to personal characteristics (e.g. being a girl or a Quechua speaker).

The results in Table 10, Part A, indicate that department scores varied significantly, and that between-department results were not appreciably different from those presented in the departmental-level only models (Table 9). Both household expenditures and the proportion of ISP trained teachers were positively associated with mean departmental scores. Holding other variables constant, the performance of extremely poor departments was significantly better than that in nonpoor and average departments.

Table 10, Part B, displays the results of school-level factors that affected mean school mathematics achievement. School level factors could potentially vary among departments. Six school factors significantly impacted school mean achievement:

- The percentage of girls in a school was inversely related to achievement. As Part B indicates, this effect did not vary from department to department (hence a national average effect).

- The percentage of over-aged students was also inversely related to achievement. This effect varied significantly among departments, meaning that some departments have done a better job, on average, than others with over-aged students.

- The proportion of Quechua speakers was also inversely related to achievement. This effect also varied among departments. However, neither the proportion of Quechua speakers in the department, nor the department average poverty level, directly affected this school-level phenomenon[16]. On average, schools attended predominantly by Quechua speakers had lower scores than schools attended predominantly by Spanish speakers.[17]

- The number of years of service a teacher had showed positive effects on math test scores.

- The number of training courses a teacher had attended was positively associated with mathematics achievement. This effect did not vary among schools or departments.

- Students attending private schools scored significantly better than students attending public schools. This effect did not vary among schools or departments. In other words, the effects of private schools were homogenous—on average they were all about the same.

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[16] Although, as a group these two variables reduce the variation by about 20 percent.

[17] In this particular model, Aymara speakers, who performed about equal to Spanish speakers, were grouped together with Spanish speakers.

Table 10, Part C, presents student factors affecting mathematics achievement. Student factors could potentially vary among schools, among departments, or both schools and departments. Another group of five variables were found to be associated with test scores, either negatively or positively:

- There was a significant gender gap in mathematics achievement. On average girls scored about 3.4 points below boys. The gender gap varied significantly among schools. This variation is highlighted by comparing the gender gap at a school where the effect was one standard deviation (SD) above average with that in a school where the gender gap was one SD below average. The gender gap was approximately 7 points at schools where the gap was one SD above average, but disappeared at schools where the gap was one SD below average. Once the departmental poverty level was taken into account, the gender gap did not vary among departments. The gender gap was smaller in extremely poor departments.

- Over-aged students also scored significantly below students who were at the right age for the grade. The average effect was about 2.6 points and varied significantly among schools. At schools where the over-age effect was one SD above average, over-aged students scored about 5 points lower; however, at schools where the over-age effect was one SD below average, the over-aged students performed as well as the regular-aged students. The variation among schools was partially accounted for by the proportion of over-aged students in school. Over-aged students attending schools with a greater proportion of their peers performed better as the proportion of over-aged students increased. This might be related to a more effective teaching-learning environment when teachers did not have to cover a wider age-range within the same class. The student-level effect is not dependent upon the departmental poverty level.

- The student-level Quechua effect was not statistically significant at the 5 percent level, once the school and departmental effect were taken into account. Controlling for other variables, a Quechua speaking student would perform equal to a Spanish speaking student. However, the greater the proportion of Quechua speakers in a school, the poorer was the school's performance. This shows that Quechua speaking students are not inherently less able, but rather that schools that were attended predominantly by Quechua students, for reasons *not* identified in this model, performed poorly. Future research should investigate what might be the reasons for this phenomenon.

- Four variables which proxied parental expectations (as in the 2-level model) were statistically significant and in the expected direction. The effects of parent expectations were homogeneous throughout the country (the effects did not vary among schools or departments).

- Text materials mattered. Students without texts performed below students who had some form of text.[18] Again, this effect was homogeneous among schools and departments.

[18] In the two-level model this variable is broken into several possibilities, the level three model simply contrasts students without texts against all other students.

Table 10: Final Three-Level Model for Average Student Achievement with Interaction		
Part A: Between department effects	**Effects**	**S.E.**
Adjusted national grand mean	43.93	0.80 ****
Public expenditure per student	-0.04	0.02
Household expenditure per capita	0.08	0.04 *
Nonpoor department	-3.15	2.81
Poor department	6.01	2.59 *
Extremely poor department	11.72	3.20 **
Departmental percentage of:		
Students in private school	0.05	0.09
Quechua students	-0.06	0.06
Female students	-0.32	0.34
Over-aged-students	-0.02	0.13
Teachers from universities	0.17	0.10
Teachers from ISPs	0.21	0.08 *
Part B: Between schools and departments		
Model for % of girls in a school		
National average effect	-0.05	0.02 **
Model for % of over-age students-in a school		
National average effect	-0.18	0.02 ****
Model for % of Quechua students in a school		
National average effect	-0.20	0.04 ****
Departmental % of Quechua students	0.00	0.00
Nonpoor department	-0.11	0.15
Poor department	0.11	0.09
Extremely poor department	0.18	0.11
Model for % of Aymara students in a school		
National average effect	-0.06	0.04
Model for teacher from universities		
National average effect	1.93	1.15
Model for teacher at school from ISP		
National average effect	0.36	0.81
Model for teacher at school years of service		
National average effect	0.11	0.05 *
Model for teacher at school # of training courses		
National average effect	0.27	0.12 *
Model for director at school Quechua		
National average effect	-0.99	1.33
Model for school in jungle		
National average effect	1.09	2.29
Model for school in mountains		
National average effect	-0.69	1.89
Model for school rural		
National average effect	-0.71	1.02

Model for private school		
National average effect	10.77	1.11 ****
Model for teacher in school Quechua		
National average effect	0.12	1.43
Part C: Between students, schools, and departments		
Model for gender gap		
Model for mean gender gap		
National average effect	-3.41	0.24 ****
Nonpoor department	-1.46	0.78
Poor department	0.67	0.62
Extremely poor department	1.71	0.65 *
Model for teacher service year effect on gender gap		
National average effect	0.00	0.03
Model for over-age-student effect		
Model for mean over-age-student effect		
National average effect	-2.59	0.30 ****
Nonpoor department	-0.14	0.98
Poor department	-1.09	0.75
Extremely poor department	-0.13	0.72
Model for school % over-age-student effect		
National average effect	0.06	0.01 ****
Model for Quechua student disadvantage		
Model for mean Quechua student disadvantage		
National average effect	-0.87	0.48
Departemental % Quechua effect	-0.07	0.03 *
Nonpoor department	2.14	1.34
Poor department	0.37	1.21
Extremely poor department	1.51	1.46
Model for school % Quechua effect		
National average effect	0.03	0.02
Model for Aymara student effect		
National average effect	0.42	0.72
Model for Parent Expectations		
Model for gain in literature effect		
National average effect	-1.19	0.23 ****
Model for gain in mathematics effect		
National average effect	1.10	0.26 ****
Model for gain in comprehensive way effect		
National average effect	0.62	0.23 **
Model for gain nothing effect		
National average effect	-2.74	0.37 ****
Model for no text effect		
National average effect	-0.91	0.24 ****

Key: **** p<=0.0001; ***p<=0.001; **p<=0.01; *p<=0.05

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(c) Variance in outcomes attributable to differences between students, between schools, and between departments

The unconditional models for three-level analysis found that 12 percent of the variance in math test scores was attributable to differences in characteristics between departments. Within departments, 43 percent of the variance in test scores was attributable to characteristics between schools. Within schools, 45 percent of the variance was due to characteristics among students within schools. (Equations 1-6).

Table 11 displays the amount of variance explained by variables at all three levels. Cumulatively, student ascriptive characteristics, text materials, and parental roles and expectation explained 3.8 percent of the variance in achievement between students; school enrollment characteristics, geographic, public or private sector, teacher and principal characteristics explained 33 percent of variance between schools; ascriptive characteristics, public or private sector, teacher characteristics, and household expenditure explained 43 percent of variance between departments. That the amount of variance explained by student-level variables was reduced from those in Table 7 is because the variables have been reduced from the previous model. That the variance explained by department-level variables is substantially less than those percentages reported in Table 9 is because these are conditioned on the lower level variables in the model.

Conclusion. The findings of this analysis yield positive messages. In spite of the gap in mathematics outcomes between gender, region, rural and urban areas, private and public schools, and the coast, mountain, and jungle, after controlling for a number of explanatory variables the picture has changed. Students in poor and extremely poor departments performed better than those in nonpoor and average departments, holding other variables constant. Some departments were doing a better job in educating over-aged students. The gender gap was less pronounced in extremely poor departments. Aymara students performed equally well as Spanish speaking students. Quechua students could perform equally well if they were not attending predominantly Quechua schools, thereby indicating that the problem lies in the schools, not in the students. Teachers graduated from universities, teachers graduated from ISPs, teachers with longer years of service, and teachers who have had more in-service training were associated positively with student achievement nationwide. Nonavailability of text books was negatively associated with outcomes. Parental expectation for better performance in the relevant subject was translated into higher student performance.

It may be recalled that the existing sample excluded single-teacher schools in the remote areas which concentrated in the Sierra and Selva regions. If these schools and students were distributed equally across all departments in the Sierra and Selva and were included in the sample, they might not pull down the averages at the student, school, or departmental levels, but they could increase the standard deviation. If they concentrated in a few departments, they might pull down the average of those departments. In either case, if these rural schools and students were included in the sample, the variance between departments and between schools would most likely increase, which, in turn, would proportionally reduce the variance within schools (between students). Given that teachers in remote schools have lower academic qualifications, fewer in-service trainings, and less years of services, the effects of these variables could be larger.

If single-teacher schools were included in the sample, would it change the optimistic observations of this analysis? It would probably modify but not substantially change the outlook. Given the very large positive coefficient in the extremely poor departments (11.76 and statistical significance at p.<=0.01 level in the final model), even if the sample included single-teacher schools and students, the performance of the high poverty departments might still be marginally better than the other departments, when other explanatory variables were held constant. However, the smaller coefficient in poor departments (6.01 and significance at p<=0.05 level) might be further reduced or lose its statistical significance. In this case, the observations for the extremely poor departments might still hold, but not for others. The finding for the Aymara may not change because they live closer to urban areas than other indigenous peoples. The negative effects of Quechua schools is likely to still hold or grow bigger. If most of the remote schools are in the jungle areas, there would be new findings on the determinants of their achievement. The finding on over-aged students is also likely to hold because teachers probably teach to the students in the middle age range and neglect the needs of the older and younger kids. Gender is likely to remain a serious issue.

Whatever the limitations of the existing sampling frame and dataset may be, they would not negate the importance of the findings and policy implications for the majority of the 4th Graders in the country. The findings point to the opportunity for public policy to make a real difference for disadvantaged students. *The interventions should be universal where the effects have nationwide impact (that is, little variation at the school and departmental levels).* These include textbook provision, teacher pre-service and in-service training, providing incentives for experienced teacher to remain in the profession, deploying qualified and experienced teachers to the rural areas, specific training to teach more effectively to over-aged students, and using the mass media and parents associations to enhance parents' role in supporting their children's education. *Where the effects vary across departments or schools, targeted interventions are desirable.* These include specific support for schools where Quechua (and other indigenous people) are predominant. This might require strengthening bilingual education and text materials. In better schools, special attention might need to be paid to bring girls and over-aged students up to the standards of other students. (See Table 4 in Volume 1 for a summary of the effects crossing between departments, schools, and students).

Table 11: The Extent to Which Mathematics Outcomes Is Accounted for by Student, School, and Department-Level Characteristics

	Mean	S.E.		
True School Mean Mathematics Achievement	45.1 *	0.46		
Random effects ANOVA				
Level -1 (between students) (eijk)	216.6			
Level -2 (between schools) (rjk)	206.6			
Level -3 (between schools) (U0)	55.9			
Amount of variation in mathematics achievement attributable to schools				43.1%
Variation in True School Mean Mathematics Achievement between schools				
	+ 1sd	59.49		
	- 1sd	30.75		
Amount of variation in mathematics achievement attributable to departments				11.7%
Variation in True School Mean Mathematics Achievement between departments				
	+ 1sd	52.60		
	- 1sd	37.64		
Within-school variables (1)			Variance component (2)	Cumulative variance explained
1) Ascriptive characteristics			209.7 *	3.2%
2) Materials (texts)			208.4 *	3.8%
3) Parental roles & expectations			208.3 *	3.8%
Between-school variables (3)				
4) School enrollment characteristics			151.3 *	26.8%
5) Geographic			151.5 *	26.7%
6) Private or public sector			139.6 *	32.4%
7) Teacher characteristics			137.9 *	33.3%
8) Principal characteristics			137.9 *	33.3%
Between-department variables (4)				
9) Ascriptive (demographic)			19.1 *	26.0%
10) Private or public sector			16.3 *	37.0%
11) Teacher characteristics			14.6 *	42.2%
12) Household expenditure			14.9 *	43.5%

Notes:

(1) Level-one model is a reduced form from that presented in the two-level analysis.

(2) Indicates whether the intercept varies significantly after variables are included in model.

(3) School-level (level-2) variables model the intercept only. This is also true for level 3 variables.

(4) The variance explained is substantially less than those percentages reported in Table 9 because these are conditioned on the lower level variables in the model.

* P<=.05.

Background Note 5.
Teacher Education and Professional Development[19]

System of pre-service training. Teacher education in initial, primary, and secondary education is under two modalities: (i) pre-service training with 10 semesters of academic studies in ISPs, Higher Education for the Arts, Physical Education, and Theology, and in the education faculties of universities; and (ii) professional studies of 12 semesters' duration for the currently serving teachers without credentials to attend classes during vacations and to use distance learning methods during the year. There are 318 ISPs and 38 universities authorized to train teachers in the regular mode.[20]

Of the ISPs, 138 are public and 180 private. Private ISPs absorb 61 percent of the enrollment. At the college level, there are more faculties of education in public universities (21 of 29 universities) than private (17 of 35). MED authorizes course offerings and prescribes curriculum in public and private ISPs, while the National Council for Authorization of Function of Universities (CONAFU), an autonomous organ under the National Council of Rectors, approves the course offerings of education faculties in universities. Since the universities are autonomous, they have more freedom to decide on the curriculum. The MED, the universities, and the ISPs do not conduct systematic consultation with each other regarding the curriculum or about the number of entrants or graduates on the basis of the projected need for qualified teachers. One of the reasons for the low passing rate at the teachers' selection test may be due to the lack of agreed curriculum of teacher training.

Public ISPs confer the professional title of "teacher" (Profesor) which is a nationwide title, with specification about the level and the specialty they can teach. Graduates from public ISPs are required to do a thesis on education research before they are conferred the professional title. Graduates from private ISPs are required to pass an exam set by the MED (according to a recent regulation, D.S. N0 008-98-ED). The universities can confer the academic title of Bachelor in Education (Bachiller en Educación) and the professional title of Licensed in Education (Licenciado en Educación). The teacher graduates from ISPs can obtain the title of Bachiller en Educación in the universities without passing an entrance exam. To obtain this title, it is required to attend two more semesters of complementary studies that universities organize for this purpose. The title of Bachiller en Educación allows continuation of studies in postgraduate work. The titles of Profesor and Licenciado are equivalent and give equal status in the public career of teaching (Ley del Profesorado, 1984).

The excess supply of teachers, accelerated by the rapid growth of private ISPs in the 1990s, may have compression effects on the level of remuneration for teachers. The proportion of university applicants who want to major in education declined from 27 percent in 1960–64 to 8–10 percent in the 1980s and 1990s. The quality of teacher education in the ISPs is alleged to be poor, and students in education faculties are alleged to have the lowest entrance scores among university aspirants. Not all of the students in ISPs enter teaching after graduation. To many, it is

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[19] This analysis was undertaken by Maria Amelia Palacios.

[20] The sources are the preliminary results of the 1997 census of technical and pedagogical education, and information from the National Council of Rectors.

one of the relatively easy routes for entry into tertiary education. This also explains why students are willing to pay to enter private ISPs, in spite of the relatively low pay and prestige in education, as well as the instability of employment given the difficulty of getting appointed to a pensionable position.

Characteristics of ISP students. According to the 1997 Census of ISPs, 227,942 students were enrolled in public and private ISPs. 61 percent of them studied in public ISPs and 59 percent were females. Of those who studied in private ISPs (39 percent), 70 percent were females. Only 83 percent of those who are in teacher training proceed to teach in public schools, generally in the same department where they were trained. Most of these are from poor families. This explains why 30 percent of young people work when they study (Arregui, Hunt and Díaz, 1996). About one-third of students have a mother tongue that is not Spanish. The entrance examination in the regular program of pre-service training is not demanding; about 52 percent of applicants are admitted, although public ISPs are more selective than private ones (Arregui, Hunt and Díaz, 1996). The demographic trend of a growing young population, combined with relatively easy access and growth in the supply of pre-service training, explains why the number of applicants has not diminished, in spite of low prestige of the profession, low salaries, and lack of job security.

Professional studies (for teachers without titles). Since 1975, the training of teachers who do not have titles was considered an obligation of the state. After passing the Law of Teachers, the supply of public and private training programs increased significantly in the country since 1985. Created to be of a transitory nature, it has been ongoing due to the continuous demand. In 1996, the basic statistics of MED reported an enrollment of 30,753 persons in the professional program. Not all the participants, however, teach because many enter these programs in search of a profession.

In 1996, due to irregular functioning of professional studies and criticism of poor quality, MED restricted professional studies' course offerings in ISPs (51 in 1995) and did not renew the permit with universities (15 universities in 1995). Recently, it has also suspended the intake of new students in professional studies in ISPs, and only 10 public ISPs can continue until their students graduate. In the case of universities, in 1997, only the National University of San Marcos, with its campuses in Lima, Huaraz, and Tarapoto, has an enrollment of 1,439 students, of which 73 percent were in secondary education.

Curriculum of pre-service training. Pre-service training in public and private ISPs follows the same curriculum that was approved in 1985 by MED (R.M. No 759-85-ED), unless it is authorized to experiment with an alternative curriculum. The universities are autonomous and as such follow their own curriculum. In 1996, MED provided a pilot plan of modernization of teacher training in primary education. The pilot plan began with participation of 13 ISPs (of which 11 are public and 2 are private). In 1998, another 11 public ISPs joined the pilot (supported by the IDB); the new curriculum of teacher training in secondary education was added, with specialization in social science (7 ISPs) and natural science (10 ISPs). Meanwhile, there coexist in ISPs two curricula for pre-service training:

- *The basic curriculum for training teachers.* This is applied in approximately 50 public and private ISPs for the specialty in primary education, in all ISPs with the specialty in initial education, and in all the ISPs with the specialty in secondary education (with the exception of 10 pilots).

- *The pilot curriculum for pre-service training in primary education.* This is being piloted in 63 ISPs (of which 22 are public, 2 are private, and 39 are associated with public).

The following table compares two curricular proposals in three key features: the curricular organization, the number of hours and the credit assigned to each component, and the weight of the practicum. The pilot curriculum introduces three important innovations: (a) the organization of content in six new major areas; (b) integration of education research with studies; and (c) the early initiation into practicum and extension to the last semester to account for 21 percent of the total time of the training program.

Table 1: A Comparison of Old and New Pilot Curriculum in Teacher Education

	Old Curriculum (since 1985)				Curriculum in the Pilot Plan (since 1996)			
Curricular areas	# of assignment	# of hours	%	% of credit	# of sub-areas	# of hours	%	# of credit
General education	16	1248	26	56				
Professional education								
Basic	18	1216	25	56				
Specialty	20	1728	25	79				
Practicum		608	13	29		1152	21	
Ecosystem					3	576	10	24
Society					3	648	12	24
Integrated communication					3	936	17	37
Mathematics					3	432	8	18
Education					5	1368	25	97
Religious education					3	288	5	8
Work and production					3	144	2	6
Total	54	4800	89	220	23	5544	100	238

Source: Ministry of Education

Remuneration, qualifications, and professional development of teaching staff in ISPs. The remuneration of ISP trainers is very low. In public ISPs, the average monthly pay is 680 soles for a workload based on 24 hours per week, and 850 soles for a 40-hour workload. However, the so-called workload is only a label and does not reflect the amount of work done. There is not much difference in private ISPs. These centers pay teachers by the hour, usually between 5 to 7 soles per hour. For a workload of 24 hours, a teacher in a private ISP would earn between 480 and 672 soles per month, less than those in a public ISP.

Teaching staff in ISPs are almost uniformly trained in the field of education (as opposed to a liberal arts education with specialty in history, mathematics, or physics). According to the 1997 census of teacher-training institutions, 83 percent of the teaching staff in public ISPs and 85 percent of them in private ISPs had a major in pedagogical studies. There are others who studied psychology, sociology, law, or engineering. According to the evaluation report of the pilot plan, 40 percent of the ISP teachers in the sample declared that they studied other fields. In 1993, 70

percent of the 4,558 teacher trainers in service worked in public institutions (Census, 1993). In 1997, the number rose to 7,658, but only 49 percent taught in public ISPs (Census, 1997) due to a rapid increase in private ISPs. Between 1990 and 1995, private ISPs grew by almost 17 times, stimulated by the government policy to promote private investment in education (Diaz, 1996). The analysis of teacher training in Peru by Arregui, Hunt and Díaz (1996) indicates that about half of the trainers in ISPs and universities were themselves trained in ISPs or Normal Schools, while the other half were trained in universities. Only 11 percent of ISP teachers in the sample were trained through professional studies.

About 52 percent specialized in secondary education, and 23 percent in primary education. Of the total staff, about 21 percent specialized in math and sciences. Among those graduates of regular programs and professional studies, the 1993 census found that 20 percent specialized in secondary education with emphasis in mathematics or science. Among secondary teachers, 36 percent specialized in mathematics and/or science. MED has authorized recently (R.M. No 289-98-ED) implementation of the pilot plan of Bachillerato, which is two years of postsecondary studies requisite for higher education. This proposal cut secondary education by a year. There is not yet an established curriculum to train teachers for this level of education. A major challenge to expansion of secondary education and the introduction of the new Bachillerato is undoubtedly the need to rapidly strengthen the academic and professional capacity of teacher educators.

There exist 47 postgraduate programs of study in education—39 at the master's level and 8 at the doctoral level. However, few of the trainers have themselves completed such postgraduate education. About 37 percent of trainers are studying in a university to obtain the Bachelor's degree, a second specialty, or a higher degree (Arregui, Hunt and Díaz, 1996). An evaluation study of the Pilot in 10 ISPs found that one-third of trainers in ISPs have a Bachelor's degree and one-fifth have a Master's degree.

Although the offering of in-service training in universities, ISPs, and NGOs has increased notably in recent years, the cost is beyond the reach of many trainers. Since 1996, MED began to finance the professional development of teacher trainers. In 1997, it trained about 300 ISP trainers through 13 courses and an international event in Lima (Evaluation of the Pilot Plan, 1998). The low salaries of ISP teachers is the main reason that they cannot access a more permanent form of training in the private sector.

Diversification of pre-service training. The more important efforts to diversify in-service training are those linked with training of indigenous teachers. About 17 percent of the Peruvian population speak Quechua (3.5 million) and 3.2 percent (half a million) speak other indigenous languages. However, teaching is conducted in Spanish in 95 percent of the education centers in the country. Of 2,706 bilingual schools in the country, 72 percent are in primary education. The majority of them (1,682 schools) teach in Quechua (1993 Census). The experience of diversification of teacher training can be summarized as follows:

(a) *The curricular model for pre-service and in-service training for teachers in bilingual and intercultural education*. In 1993, MED authorized a five-year experiment in diversification in 10 selected institutions (8 ISPs and 2 universities). Only 3 public ISPs out of 8 have experimented with part of the models for as much as seven months. The two public universities

have not even done that. Recently, an analysis of the experience is being conducted.

(b) *The professional training of teachers in Andian rural areas.* This has been ongoing since 1988, undertaken by the Technical and Pedagogical Higher Institute of Urubamba in conjunction with the Catholic University of Peru. Among the major contributions are the organization of curricular content and improvement of the articulation between theory and action.

(c) *The program to train bilingual teachers of the Amazon region.* This was developed by the Public ISP of Loreto in association with the AIDESEP in1998. It is a curriculum of six years of study in intercultural and bilingual education in primary education for the Amazon region. One of the more interesting innovations is the intensive and supervised practicum in the last two years of training that leads to the employment of students either as permanent or contract staff by the MED to teach in communities in the jungle.

Issues in teacher education.

The main issues are as follows:

(a) *The quality of academic emphasis and pedagogy.* The divorce between theory and practice in teacher education has undermined the quality of teacher preparation. The universities emphasize theory at the expense of practice while the ISPs prefer the instruments of teaching at the cost of a solid foundation in the content of teaching.

(b) *The difference in academic status between the Profesor and the Licenciado* that requires the former to study for an additional year in university in order to complement this academic formation and to access postgraduate studies. This has contributed to the public perception that the Profesor is inferior to the Licenciado.

(c) *The lack of linkage between universities and ISPs in sharing innovations and research.* The evaluation of the pilot plan found that the trainers tended to initiate students in social research but not in education research, and that, although there are exceptions, few teachers in ISPs have pursued research themselves, leading to a loss of prestige.

(d) *The absence of incentives for teachers to strive for excellence.* The policy towards teacher remuneration is a major constraint (in terms of time and money) that does not enable teachers to use their own resources and outside of work hours for professional development. The ISPs do not have budgetary resources to support continuous development, and the state does not have a policy for professional development of the trainers of teachers, nor give much attention to those working outside big cities.

(e) *The unsustainable increase in the supply of teacher training.* The rapid growth in private ISPs in the 1990s has not been accompanied by evaluation of the quality of training. Since the MED has the only authority to grant permission to the operation of private ISPs, it can also plan a more adequate system of teacher training by taking into account vacancies, specialties, and differential demand for teachers by department/areas. The mechanism of accreditation and supervision of the quality of service of private ISPs should be the first area of concern.

(f) *The persistence of untrained teachers is a serious issue.* They vary by level of education, accounting for 43 percent in initial education, 41 percent in primary education, and 55 percent in special education. In addition, there are untrained teachers in secondary education. Professionals from other careers who do not have pedagogical titles but wish to become part of the teaching profession have followed the same complementary program in some universities in order to enter a public teaching career. However, it is not clear whether this is authorized by MED.

(g) *There is no evaluation of the quality of teacher education:* availability of qualified human resources and support materials (such as libraries, instructional materials, access to computers), the relevance of teacher education to the reality and diversity of the student population, and the efficacy to develop in the majority of students the competencies teachers want in their professional profile.

Options for improvement

These are as follows:

(a) *Promote education research along with extending access to information about teacher training.* Teachers in different cultural and socioeconomic contexts should produce their own knowledge. This production can be advanced by interchange with educators in the world. ISPs should strengthen collaboration with education researchers. MED can promote and coordinate a research agenda for teacher education.

(b) *Support directors and trainers in the ISPs* by making available the necessary conditions for innovation: continuous professional development in their work center and outside, scholarships for study abroad, teaching materials to support innovation, access to journals and publications that inform trainers about innovation in their area of work, freedom to experiment, and opportunity and time to disseminate the results.

(c) *Progressively improve teacher incentives.* Economic and noneconomic incentives should be designed to increase work satisfaction: such as stimulus for innovators, opportunity for professional development linked to classroom needs, supplying modern instructional materials, encouraging professional knowledge of students and parents, raising teachers' authority with the community, and fostering a climate favorable for group work.

(d) *Evaluate the results of training programs, particularly those where great resources and efforts have been invested.* For example, the impact of the national plan to train teachers and education management (PLANCAD and PLANCGED) should be evaluated to assess the improvement in the linkage between teacher training and reality of public schools. There should be a permanent system of evaluation of practicum in public schools. This needs to be a combined internal and external evaluation that takes account of the experience and knowledge of trainers, authorities, and students, and detects problems and proposes solution to the deficiencies.

(e) *Design a new strategy to qualify the teachers without titles.* It should be offered exclusively to current serving teachers without titles; organized and executed by accredited public and

private institutions, supported with proper resources to ensure that it achieves its objective; and giving priority to those education levels and departments where unqualified teachers are most numerous (Loreto, Madre de Dios, Callao, Huancavelica, San Martín, Amazonas, and Ucayali.)

(f) *Plan the supply of training collaboratively among the MED, the universities, and the ISPs.* Since the state is the major employer of teachers, it is indispensable that it articulate supply and demand (Diaz, 1996).

(g) *Recruit and select diverse applicants for teacher training.* New mechanisms should be designed to select candidates for teacher training by attracting youth from diverse social sectors and including professionals from other careers.

(h) *Organize continuous professional development of teacher trainers to be financed by the state* by taking into account the following elements: (i) a process of professional development linked with the reflection of teaching practice; (ii) a training centered in the ISPs that can take account of the specific needs of teachers; (iii) encouragement of the participation of trainers in the process of reform of the teaching profession; (iv) involvement of teachers in planning and evaluation of the training program; and (v) incorporation of innovations and lessons of experience from the nation's classrooms.

APPENDICES

APPENDIX 1

STUDENT ENROLLMENT STATISTICS

Appendix 1.1: Enrollment in Formal and Nonformal Education (Disaggregated by Minors and Adults) in Public Institutions by Level, 1990-1997

PUBLIC									Rates of change (percentage)
Levels and/or modalities	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1990-1997**
FORMAL	6,087,234	6,069,175	6,053,033	6,189,652	6,321,889	6,453,367	6,568,545	6,620,329	8.76
NONFORMAL	333,985	325,077	322,732	333,705	361,614	376,099	411,248	426,025	27.56
Initial education	702,791	707,873	721,190	775,396	806,804	841,924	908,070	938,539	33.54
Formal	412,699	419,542	431,644	470,452	475,528	494,254	521,607	537,777	30.31
Nonformal	290,092	288,331	289,546	304,944	331,276	347,670	386,463	400,762	38.15
Primary education	3,495,454	3,469,558	3,456,391	3,568,050	3,646,818	3,702,418	3,739,198	3,768,797	7.82
Minors	3,400,694	3,388,558	3,380,619	3,495,394	3,576,092	3,633,236	3,672,369	3,701,748	8.85
Formal	3,398,840	3,387,243	3,379,367	3,494,418	3,574,954	3,632,150	3,671,801	3,701,175	8.90
Nonformal	1,854	1,315	1,252	976	1,138	1,086	568	573	-69.09
Adults	94,760	81,000	75,772	72,656	70,726	69,182	66,829	67,049	-29.24
Formal	74,839	64,771	61,631	60,446	58,630	57,161	57,067	57,238	-23.52
Nonformal	19,921	16,229	14,141	12,210	12,096	12,021	9,762	9,811	-50.75
Secondary education	1,652,019	1,628,485	1,608,051	1,628,457	1,675,843	1,719,169	1,776,682	1,819,897	10.16
Minors	1,443,914	1,439,063	1,428,464	1,458,680	1,510,876	1,556,555	1,620,805	1,662,946	15.17
Formal	1,443,914	1,439,063	1,428,464	1,458,590	1,510,876	1,556,555	1,620,805	1,662,946	15.17
Nonformal	0	0	0	90	0	0	0	0	-
Adults	208,105	189,422	179,587	169,777	164,967	162,614	155,877	156,951	-24.58
Formal	196,543	178,976	170,335	161,366	156,130	154,345	148,156	149,045	-24.17
Nonformal	11,562	10,446	9,252	8,411	8,837	8,269	7,721	7,906	-31.62
Tertiary nonuniversity education	131,876	143,352	150,732	159,318	169,122	174,358	162,188	165,068	25.17
University education	291,179	312,735	306,416	252,934	242,133	246,678	251,316	210,779	-27.61
Other	147,900	132,249	132,985	139,202	142,783	144,919	142,339	143,274	-3.13
Special education	16,952	16,054	16,312	16,943	18,527	19,833	20,962	21,291	25.60
Formal	16,952	16,054	16,312	16,943	17,259	18,292	19,246	19,477	14.89
Nonformal	0	0	0	0	1,268	1,541	1,716	1,814	-
Vocational education	130,948	116,195	116,673	122,259	124,256	125,086	121,377	121,983	-6.85
Formal	120,392	107,439	108,132	115,185	117,257	119,574	116,359	116,824	-2.96
Nonformal	10,556	8,756	8,541	7,074	6,999	5,512	5,018	5,159	-51.13

Source: Ministry of Education.

Appendix 1.2: Enrollment in Formal and Nonformal Education (Broadly Grouped) in Public Institutions by Level as Percentage of Total, 1990-1997

FORMAL	1990	1991	1992	1993	1994	1995	1996	1997
Initial education	6.78	6.91	7.13	7.60	7.52	7.66	7.94	8.12
Primary education	57.06	56.88	56.85	57.43	57.48	57.17	56.77	56.77
Secondary education	26.95	26.66	26.41	26.17	26.37	26.51	26.93	27.37
Tertiary nonuniversity education	2.17	2.36	2.49	2.57	2.68	2.70	2.47	2.49
University education	4.78	5.15	5.06	4.09	3.83	3.82	3.83	3.18
Other	2.26	2.03	2.06	2.13	2.13	2.14	2.06	2.06
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
NONFORMAL								
Initial education	86.86	88.70	89.72	91.38	91.61	92.44	93.97	94.07
Primary education	6.52	5.40	4.77	3.95	3.66	3.48	2.51	2.44
Secondary education	3.46	3.21	2.87	2.55	2.44	2.20	1.88	1.86
Other	3.16	2.69	2.65	2.12	2.29	1.88	1.64	1.64
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
FORMAL AND NONFORMAL								
Initial education	10.94	11.07	11.31	11.89	12.07	12.33	13.01	13.32
Primary education	54.44	54.26	54.21	54.70	54.56	54.21	53.57	53.49
Secondary education	25.73	25.47	25.22	24.96	25.07	25.17	25.45	25.83
Tertiary nonuniversity education	2.05	2.24	2.36	2.44	2.53	2.55	2.32	2.34
University education	4.53	4.89	4.81	3.88	3.62	3.61	3.60	2.99
Other	2.30	2.07	2.09	2.13	2.14	2.12	2.04	2.03
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Ministry of Education

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Appendix 1.3: Enrollment in Formal and Nonformal Education (Disaggregated by Minors and Adults) in Private Institutions by Level, 1990-1997

PRIVATE									Rates of change (%)
Levels and/or modalities	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1990-1997**
FORMAL	1,222,386	1,251,568	1,271,364	1,285,169	1,292,480	1,335,264	1,343,105	1,363,661	11.6%
NONFORMAL	13,687	15,918	18,345	27,784	24,132	24,837	34,774	37,660	175.2%
Initial education	94,472	100,707	106,499	121,895	129,834	138,587	151,311	152,755	61.7%
Formal	91,476	98,887	104,963	119,601	128,418	136,912	146,981	149,316	63.2%
Nonformal	2,996	1,820	1,536	2,294	1,416	1,675	4,330	3,439	14.8%
Primary education	461,807	475,285	478,323	487,251	492,293	504,580	494,269	504,773	9.3%
Minors	456,442	470,222	473,731	482,449	486,933	499,085	488,384	498,288	9.2%
Formal	456,442	470,222	473,731	482,275	486,767	498,935	488,134	498,180	9.1%
Nonformal	0	0	0	174	166	150	250	108	-
Adults	5,365	5,063	4,592	4,802	5,360	5,495	5,885	6,485	20.9%
Formal	4,598	4,000	3,531	3,190	3,088	3,011	2,808	3,183	-30.8%
Nonformal	767	1,063	1,061	1,612	2,272	2,484	3,077	3,302	330.5%
Secondary education	271,408	292,735	299,011	319,129	326,035	332,918	343,094	346,985	27.8%
Minors	254,029	271,652	275,533	289,126	299,473	306,173	310,112	308,147	21.3%
Formal	254,029	271,652	275,533	289,126	299,473	306,173	310,112	308,147	21.3%
Nonformal	0	0	0	0	0	0	0	0	0
Adults	17,379	21,083	23,478	30,003	26,562	26,745	32,982	38,838	123.5%
Formal	8,711	9,119	8,721	7,282	6,703	6,757	7,521	8,027	-7.9%
Nonformal	8,668	11,964	14,757	22,721	19,859	19,988	25,461	30,811	255.5%
Tertiary nonuniversity education	103,428	109,605	118,457	104,558	115,472	124,536	138,669	141,634	36.9%
University education	151,753	162,974	157,083	150,157	123,894	126,230	128,603	142,130	-6.3%
Other	153,205	126,180	130,336	129,963	129,084	133,250	121,933	113,044	-26.2%
Special education	3,450	3,351	3,273	4,785	3,482	3,865	3,888	3,473	0.7%
Formal	3,450	3,351	3,273	4,785	3,482	3,865	3,888	3,473	0.7%
Nonformal	0	0	0	0	0	0	0	0	0
Vocational education	149,755	122,829	127,063	125,178	125,602	129,385	118,045	109,571	-26.8%
Formal	148,499	121,758	126,072	124,195	125,183	128,845	116,389	109,571	-26.2%
Nonformal	1,256	1,071	991	983	419	540	1,656	0	-100.0%

Source: Ministry of Education

Appendix 1.4: Enrollment in Formal and Nonformal Education (Broadly Grouped) in Private Institutions by Level as Percentage of Total								
FORMAL	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
Initial education	7.48%	7.90%	8.26%	9.31%	9.94%	10.25	10.94	10.9%
Primary education	37.72%	37.89%	37.54%	37.77%	37.90%	37.59	36.55	36.8%
Secondary education	21.49%	22.43%	22.36%	23.06%	23.69%	23.44	23.65	23.2%
Tertiary nonuniversity education	8.46%	8.76%	9.32%	8.14%	8.93%	9.33	10.32	10.4%
University education	12.41%	13.02%	12.36%	11.68%	9.59%	9.45	9.58	10.4%
Other	12.43%	10.00%	10.17%	10.04%	9.95%	9.94	8.96	8.3%
TOTAL	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00**	**100.00**	**100.0%**
NONFORMAL								
Initial education	21.89%	11.43%	8.37%	8.26%	5.87%	6.74	12.45	9.1%
Primary education	5.60%	6.68%	5.78%	6.43%	10.10%	10.61	9.57	9.1%
Secondary education	63.33%	75.16%	80.44%	81.78%	82.29%	80.48	73.22	81.8%
Other	9.18%	6.73%	5.40%	3.54%	1.74%	2.17	4.76	0.0%
TOTAL	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00**	**100.00**	**100.0%**
Source: Ministry of Education								

Appendix 1.5: Total Enrollment in Formal and Nonformal Education (Disaggregated by Minors and Adults) in Public and Private Institutions

TOTAL

Levels and/or modalities	1990	1991	1992	1993	1994	1995	1996	1997
FORMAL	7,309,620	7,320,743	7,324,397	7,474,821	7,614,369	7,788,631	7,911,650	7,983,990
NONFORMAL	347,672	340,995	341,077	361,489	385,746	400,936	446,022	463,685
Initial education	797,263	808,580	827,689	897,291	936,638	980,511	1,059,381	1,091,294
Formal	504,175	518,429	536,607	590,053	603,946	631,166	668,588	687,093
Nonformal	293,088	290,151	291,082	307,238	332,692	349,345	390,793	404,201
Primary education	3,957,261	3,944,843	3,934,714	4,055,301	4,139,111	4,206,998	4,233,467	4,273,570
Minors	3,857,136	3,858,780	3,854,350	3,977,843	4,063,025	4,132,321	4,160,753	4,200,036
Formal	3,855,282	3,857,465	3,853,098	3,976,693	4,061,721	4,131,085	4,159,935	4,199,355
Nonformal	1,854	1,315	1,252	1,150	1,304	1,236	818	681
Adults	100,125	86,063	80,364	77,458	76,086	74,677	72,714	73,534
Formal	79,437	68,771	65,162	63,636	61,718	60,172	59,875	60,421
Nonformal	20,688	17,292	15,202	13,822	14,368	14,505	12,839	13,113
Secondary education	1,923,427	1,921,220	1,907,062	1,947,586	2,001,878	2,052,087	2,119,776	2,166,882
Minors	1,697,943	1,710,715	1,703,997	1,747,806	1,810,349	1,862,728	1,930,917	1,971,093
Formal	1,697,943	1,710,715	1,703,997	1,747,716	1,810,349	1,862,728	1,930,917	1,971,093
Nonformal	0	0	0	90	0	0	0	0
Adults	225,484	210,505	203,065	199,780	191,529	189,359	188,859	195,789
Formal	205,254	188,095	179,056	168,648	162,833	161,102	155,677	157,072
Nonformal	20,230	22,410	24,009	31,132	28,696	28,257	33,182	38,717
Tertiary nonuniversity education	235,304	252,957	269,189	263,876	284,594	298,894	300,857	306,702
University education	442,932	475,709	463,499	403,091	366,027	372,908	379,919	352,909
Other	301,105	258,429	263,321	269,165	271,867	278,169	264,272	256,318
Special education	20,402	19,405	19,585	21,728	22,009	23,698	24,850	24,764
Formal	20,402	19,405	19,585	21,728	20,741	22,157	23,134	22,950
Nonformal	0	0	0	0	1,268	1,541	1,716	1,814
Vocational education	280,703	239,024	243,736	247,437	249,858	254,471	239,422	231,554
Formal	268,891	229,197	234,204	239,380	242,440	248,419	232,748	226,395
Nonformal	11,812	9,827	9,532	8,057	7,418	6,052	6,674	5,159

Source: Ministry of Education

Appendix 1.6: Public Enrollment by Level by Department, 1997

	Initial	Primary	Secondary	Tertiary Nonuniversity	Vocational Training	Special	TOTAL
Amazonas	19,718	78,055	22,190	3,499	2,381	111	125,954
Ancash	45,788	183,130	81,421	9,955	4,298	1,172	325,764
Apurímac	23,111	97,989	28,912	2,527	1,032	144	153,715
Arequipa	30,802	116,441	72,990	11,007	2,167	806	234,213
Ayacucho	25,801	126,265	37,980	5,675	3,441	397	199,559
Cajamarca	63,658	289,380	82,741	11,418	3,503	610	451,310
Cusco	52,636	217,512	80,422	6,388	3,989	643	361,590
Huancavelica	23,409	102,940	25,894	2,570	1,345	111	156,269
Huánuco	21,003	146,903	42,718	4,479	3,203	216	218,522
Ica	28,452	85,033	61,682	7,946	5,697	498	189,308
Junín	37,979	203,690	102,040	11,064	5,263	653	360,689
La Libertad	37,466	194,442	93,898	12,390	5,765	692	344,653
Lambayeque	32,066	143,342	83,149	6,978	4,460	560	270,555
Lima – Callao	199,100	759,911	580,209	27,286	47,860	10,248	1,624,614
Loreto	42,871	180,477	58,709	4,712	5,505	328	292,602
Madre de Dios	3,872	16,673	7,147	871	231	45	28,839
Moquegua	6,266	16,553	11,602	1,852	1,750	109	38,132
Pasco	13,867	49,497	22,722	2,435	1,950	265	90,736
Piura	58,376	251,117	102,063	6,963	4,290	929	423,738
Puno	69,217	205,491	101,947	11,891	4,258	415	393,219
San Martín	26,681	122,735	45,325	3,988	1,304	298	200,331
Tacna	11,275	30,721	22,395	2,451	426	130	67,398
Tumbes	12,512	26,682	15,883	2,013	3,370	324	60,784
Ucayali	21,940	82,689	31,198	2,685	1,653	374	140,539
PERÚ	**907,866**	**3,727,668**	**1,815,237**	**163,043**	**119,141**	**20,078**	**6,753,033**

Source: Estadísticas Básicas 1997. Ministerio de Educación
Note: Enrollment includes students in both formal and nonformal education.

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APPENDIX 2
TEACHER STATISTICS

Appendix 2.1: Teachers in Formal and Nonformal Education (Disaggregated by Minors and Adults) in Public Institutions by Level, 1990-1997

Levels and/or modalities	1990	1991	1992	1993	1994	1995	1996	1997	Rates of change (%) 1990-1997
FORMAL	246,819	248,319	248,625	253,087	258,244	264,256	271,132	270,569	9.6%
NONFORMAL	4,377	3,410	3,340	3,218	3,461	3,452	3,503	3,025	-30.9%
Initial education	18,743	18,149	18,442	19,198	19,945	20,860	21,771	21,840	16.5%
Formal	16,077	16,128	16,502	17,213	17,806	18,658	19,377	19,841	23.4%
Nonformal	2,666	2,021	1,940	1,985	2,139	2,202	2,394	1,999	-25.0%
Primary education	119,741	120,430	120,013	121,238	123,517	125,262	128,579	129,335	8.0%
Minors	116,034	117,088	116,827	118,246	120,587	122,336	125,904	126,814	9.3%
Formal	115,957	117,037	116,773	118,208	120,545	122,297	125,886	126,771	9.3%
Nonformal	77	51	54	38	42	39	18	43	-44.2%
Adults	3,707	3,342	3,186	2,992	2,930	2,926	2,675	2,521	-32.0%
Formal	3,034	2,730	2,579	2,451	2,401	2,397	2,265	2,153	-29.0%
Nonformal	673	612	607	541	529	529	410	368	-45.3%
Secondary education	79,149	78,384	78,126	79,469	81,877	84,006	86,617	89,529	13.1%
Minors	71,592	71,329	71,143	72,766	75,235	77,397	80,411	83,470	16.6%
Formal	71,592	71,329	71,143	72,761	75,235	77,397	80,411	83,470	16.6%
Nonformal	0	0	0	5	0	0	0	0	-
Adults	7,557	7,055	6,983	6,703	6,642	6,609	6,206	6,059	-19.8%
Formal	7,082	6,672	6,580	6,334	6,264	6,255	5,860	5,764	-18.6%
Nonformal	475	383	403	369	378	354	346	295	-37.9%
Tertiary nonuniversity education	8,303	9,058	9,448	9,987	10,360	10,566	9,789	9,781	17.8%
University education	18,421	19,120	19,277	19,597	18,930	19,841	20,795	16,096	-12.6%
Other	6,839	6,588	6,659	6,816	7,076	7,173	7,084	7,013	2.5%
Special education	2,137	2,242	2,256	2,297	2,441	2,511	2,591	2,590	21.2%
Formal	2,137	2,242	2,256	2,297	2,356	2,416	2,446	2,473	15.7%
Nonformal	0	0	0	0	85	95	145	117	-
Vocational education	4,702	4,346	4,403	4,519	4,635	4,662	4,493	4,423	-5.9%
Formal	4,216	4,003	4,067	4,239	4,347	4,429	4,303	4,220	0.1%
Nonformal	486	343	336	280	288	233	190	203	-58.2%

Source: Ministry of Education

Appendix 2.2: Teachers in Formal and Nonformal Education (Broadly Grouped) in Public Insitutions by Level as Percentage of Total, 1990-1997								
	1990	1991	1992	1993	1994	1995	1996	1997
FORMAL								
Initial education	6.51%	6.49%	6.64%	6.80%	6.90%	7.06%	7.3%	7.3%
Primary education	48.21%	48.23%	48.00%	47.67%	47.61%	47.19%	48.1%	47.6%
Secondary education	31.88%	31.41%	31.26%	31.25%	31.56%	31.66%	32.4%	33.0%
Tertiary nonuniversity education	3.36%	3.65%	3.80%	3.95%	4.01%	4.00%	3.7%	3.6%
University education	7.46%	7.70%	7.75%	7.74%	7.33%	7.51%	6.0%	5.9%
Other	2.57%	2.51%	2.54%	2.58%	2.60%	2.59%	2.5%	2.5%
TOTAL	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.0%**	**100.0%**
NONFORMAL								
Initial education	60.91%	59.27%	58.08%	61.68%	61.80%	63.79%	68.3%	66.1%
Primary education	17.14%	19.44%	19.79%	17.99%	16.50%	16.45%	12.2%	13.6%
Secondary education	10.85%	11.23%	12.07%	11.62%	10.92%	10.25%	9.9%	9.8%
Other	11.10%	10.06%	10.06%	8.70%	10.78%	9.50%	9.6%	10.6%
TOTAL	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.0%**	**100.0%**
Source: Ministry of Education								

Appendix 2.3: Teachers in Formal and Nonformal Education (Disaggregated by Minors and Adults) in Private Institutions by Level, 1990-1997

Levels and/or modalities	1990	1991	1992	1993	1994	1995	1996	1997	Rates of change (%) 1990-1997
FORMAL	55,912	58,572	61,703	68,542	73,624	77,935	85,103	87,161	55.9%
NONFORMAL	278	493	581	736	929	959	1,406	n.a.	-
Initial education	4,426	4,763	5,237	6,736	7,952	8,744	10,081	10,931	147.0%
Formal	4,392	4,736	5,224	6,720	7,939	8,720	10,021	10,895	148.1%
Nonformal	34	27	13	16	13	24	60	36	5.9%
Primary education	17,178	17,906	18,970	21,338	22,902	24,262	26,141	27,577	60.5%
Minors	16,930	17,650	18,729	21,073	22,593	23,952	25,800	27,190	60.6%
Formal	16,930	17,650	18,729	21,072	22,586	23,945	25,778	27,180	60.5%
Nonformal	0	0	0	1	7	7	22	10	-
Adults	248	256	241	265	309	310	341	387	56.0%
Formal	217	202	188	169	159	156	143	163	-24.9%
Nonformal	31	54	53	96	150	154	198	224	622.6%
Secondary education	15,241	16,436	17,387	19,548	20,908	21,577	24,021	24,933	63.6%
Minors	14,655	15,589	16,481	18,614	19,836	20,476	22,541	23,144	57.9%
Formal	14,655	15,589	16,481	18,614	19,836	20,476	22,541	23,144	57.9%
Nonformal	0	0	0	0	0	0	0	0	-
Adults	586	847	906	934	1,072	1,101	1,480	1,789	205.3%
Formal	391	456	417	326	329	348	404	440	12.5%
Nonformal	195	391	489	608	743	753	1,076	1,349	591.8%
Tertiary nonuniversity education	5,927	6,085	6,610	7,162	7,806	8,497	9,731	9,867	66.5%
University education	9,158	9,599	9,504	9,716	9,871	10,345	10,842	9,699	5.9%
Other	4,260	4,276	4,576	4,778	5,114	5,469	5,693	n.a.	-
Special education	307	371	399	423	460	516	561	531	73.0%
Formal	307	371	399	423	460	516	561	531	73.0%
Nonformal	0	0	0	0	0	0	0	0	-
Vocational education	3,953	3,905	4,177	4,355	4,654	4,953	5,132	n.a.	-
Formal	3,935	3,884	4,151	4,340	4,638	4,932	5,082	5,242	33.2%
Nonformal	18	21	26	15	16	21	50	n.a.	-

Source: Ministry of Education

Appendix 2.4: Teachers in Formal and Nonformal Education (Broadly Grouped) in Private Institutions by Level as Percentage of Total, 1990-1997

	1990	1991	1992	1993	1994	1995	1996	1997
FORMAL								
Initial education	7.86%	8.09%	8.47%	9.80%	10.78%	11.19%	11.78%	12.5%
Primary education	30.67%	30.48%	30.66%	30.99%	30.89%	30.92%	30.46%	31.4%
Secondary education	26.91%	27.39%	27.39%	27.63%	27.39%	26.72%	26.96%	27.1%
Tertiary nonuniversity education	10.60%	10.39%	10.71%	10.45%	10.60%	10.90%	11.43%	11.3%
University education	16.38%	16.39%	15.40%	14.18%	13.41%	13.27%	12.74%	11.1%
Other	7.59%	7.26%	7.37%	6.95%	6.92%	6.99%	6.63%	6.6%
TOTAL	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	100.0%
NONFORMAL								
Initial education	12.23%	5.48%	2.24%	2.17%	1.40%	2.50%	4.27%	-
Primary education	11.15%	10.95%	9.12%	13.18%	16.90%	16.79%	15.65%	-
Secondary education	70.14%	79.31%	84.17%	82.61%	79.98%	78.52%	76.53%	-
Other	6.47%	4.26%	4.48%	2.04%	1.72%	2.19%	3.56%	-
TOTAL	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	-

Source: Ministry of Education

Appendix 2.5: Total Teachers in Formal and Nonformal Education (Disaggregated by Minors and Adults) in Public and Private Institutions by Level, 1990-1997

(percentage)

Levels and/or modalities	1990	1991	1992	1993	1994	1995	1996	1997	1990-1997
FORMAL	302,731	306,891	310,328	321,629	331,868	342,191	356,235	357,730	18.2%
NONFORMAL	4,655	3,903	3,921	3,954	4,390	4,411	4,909	3,025	-35.0%
Initial education	23,169	22,912	23,679	25,934	27,897	29,604	31,852	32,771	41.4%
Formal	20,469	20,864	21,726	23,933	25,745	27,378	29,398	30,736	50.2%
Nonformal	2,700	2,048	1,953	2,001	2,152	2,226	2,454	2,035	-24.6%
Primary education	136,919	138,336	138,983	142,576	146,419	149,524	154,720	156,912	14.6%
Minors	132,964	134,738	135,556	139,319	143,180	146,288	151,704	154,004	15.8%
Formal	132,887	134,687	135,502	139,280	143,131	146,242	151,664	153,951	15.9%
Nonformal	77	51	54	39	49	46	40	53	-31.2%
Adults	3,955	3,598	3,427	3,257	3,239	3,236	3,016	2,908	-26.5%
Formal	3,251	2,932	2,767	2,620	2,560	2,553	2,408	2,316	-28.8%
Nonformal	704	666	660	637	679	683	608	592	-15.9%
Secondary education	94,390	94,820	95,513	99,017	102,785	105,583	110,638	114,462	21.3%
Minors	86,247	86,918	87,624	91,380	95,071	97,873	102,952	106,614	23.6%
Formal	86,247	86,918	87,624	91,375	95,071	97,873	102,952	106,614	23.6%
Nonformal	0	0	0	5	0	0	0	0	-
Adults	8,143	7,902	7,889	7,637	7,714	7,710	7,686	7,848	-3.6%
Formal	7,473	7,128	6,997	6,660	6,593	6,603	6,264	6,204	-17.0%
Nonformal	670	774	892	977	1,121	1,107	1,422	1,644	145.4%
Tertiary nonuniversity education	14,230	15,143	16,058	17,149	18,166	19,063	19,520	19,648	38.1%
University education	27,579	28,719	28,781	29,313	28,801	30,186	31,637	25,795	-6.5%
Other	11,099	10,864	11,235	11,594	12,190	12,642	12,777	7,013	-36.8%
Special education	2,444	2,613	2,655	2,720	2,901	3,027	3,152	3,121	27.7%
Formal	2,444	2,613	2,655	2,720	2,816	2,932	3,007	3,004	22.9%
Nonformal	0	0	0	0	85	95	145	117	-
Vocational education	8,655	8,251	8,580	8,874	9,289	9,615	9,625	4,423	-48.9%
Formal	8,151	7,887	8,218	8,579	8,985	9,361	9,385	9,462	16.1%
Nonformal	504	364	362	295	304	254	240	203	-59.7%

Source: Ministry of Education

Appendix 2.6: Teacher-to-Student Ratio in Formal and Nonformal Education (Disaggregated by Minors and Adults) in Public Institutions by Level, 1990-1997

Levels and/or modalities	1990	1991	1992	1993	1994	1995	1996	1997
FORMAL	25	24	24	24	24	24	24	24
NONFORMAL	76	95	97	104	104	109	117	129
Initial education	37	39	39	40	40	40	42	42
Formal	26	26	26	27	27	26	27	27
Nonformal	109	143	149	154	155	158	161	184
Primary education	29	29	29	29	30	30	29	29
Minors	29	29	29	30	30	30	29	29
Formal	29	29	29	30	30	30	29	29
Nonformal	24	26	23	26	27	28	32	23
Adults	26	24	24	24	24	24	25	24
Formal	25	24	24	25	24	24	25	25
Nonformal	30	27	23	23	23	23	24	24
Secondary education	21	21	21	20	20	20	21	20
Minors	20	20	20	20	20	20	20	20
Formal	20	20	20	20	20	20	20	20
Nonformal								
Adults	28	27	26	25	25	25	25	25
Formal	28	27	26	25	25	25	25	26
Nonformal	24	27	23	23	23	23	22	21
Tertiary nonuniversity education	16	16	16	16	16	17	17	17
University education	16	16	16	13	13	12	12	13
Other	22	20	20	20	20	20	20	20
Special education	8	7	7	7	8	8	8	8
Formal	8	7	7	7	7	8	8	8
Nonformal								12
Vocational education	28	27	26	27	27	27	27	27
Formal	29	27	27	27	27	27	27	27
Nonformal	22	26	25	25	24	24	26	26

Source: Ministry of Education

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Appendix 2.7: Teacher-to-Student Ratio in Formal and Nonformal Education (Disaggregated by Minors and Adults) in Private Institutions by Level, 1990-1997

Levels and/or modalities	1990	1991	1992	1993	1994	1995	1996	1997
FORMAL	22	21	21	19	18	17	16	16
NONFORMAL	49	32	32	38	26	26	25	-
Initial education	21	21	20	18	16	16	15	14
Formal	21	21	20	18	16	16	15	14
Nonformal	88	67	118	143	109	70	72	96
Primary education	27	27	25	23	21	21	19	18
Minors	27	27	25	23	22	21	19	18
Formal	27	27	25	23	22	21	19	18
Nonformal								11
Adults	22	20	19	18	17	18	17	17
Formal	21	20	19	19	19	19	20	20
Nonformal	25	20	20	17	15	16	16	15
Secondary education	18	18	17	16	16	15	14	14
Minors	17	17	17	16	15	15	14	13
Formal	17	17	17	16	15	15	14	13
Nonformal								-
Adults	30	25	26	32	25	24	22	22
Formal	22	20	21	22	20	19	19	18
Nonformal	44	31	30	37	27	27	24	23
Tertiary nonuniversity education	17	18	18	15	15	15	14	14
University education	17	17	17	15	13	12	12	15
Other	36	30	28	27	25	24	21	-
Special education	11	9	8	11	8	7	7	7
Formal	11	9	8	11	8	7	7	7
Nonformal								-
Vocational education	38	31	30	29	27	26	23	-
Formal	38	31	30	29	27	26	23	21
Nonformal	70	51	38	66	26	26	33	-

Source: Ministry of Education

Appendix 2.8: Teachers by Level and by Department, 1997

	Initial	Primary	Secondary	Tertiary nonuniversity	Vocational training	Special	TOTAL
Amazonas	483	2,954	1,341	201	78	24	5,081
Ancash	1,072	7,030	4,750	505	200	91	13,648
Apurímac	581	3,439	1,467	136	59	30	5,712
Arequipa	722	4,469	3,613	587	88	140	9,619
Ayacucho	656	4,772	2,249	482	205	60	8,424
Cajamarca	1,423	9,822	4,449	557	123	83	16,457
Cusco	934	6,831	3,405	470	145	68	11,853
Huancavelica	491	3,407	1,380	147	76	24	5,525
Huánuco	586	4,555	2,022	264	117	29	7,573
Ica	723	2,976	3,182	518	163	74	7,636
Junín	938	7,250	5,725	781	168	88	14,950
La Libertad	957	6,249	5,190	773	192	85	13,446
Lambayeque	558	4,274	3,338	243	158	63	8,634
Lima – Callao	5,430	25,156	25,717	1,726	1,594	1,246	60,869
Loreto	1,215	6,228	2,759	242	215	63	10,722
Madre de Dios	155	661	382	59	14	11	1,282
Moquegua	230	886	768	125	62	18	2,089
Pasco	329	1,823	1,467	155	85	30	3,889
Piura	1,254	8,169	4,879	442	180	111	15,035
Puno	935	8,112	4,750	658	187	69	14,711
San Martín	902	4,578	2,230	250	62	49	8,071
Tacna	302	1,317	1,494	140	27	20	3,300
Tumbes	434	1,383	1,072	105	154	57	3,205
Ucayali	530	2,994	1,900	215	71	57	5,767
PERÚ	**21,840**	**129,335**	**89,529**	**9,781**	**4,423**	**2,590**	**257,498**

Source: Estadísticas Básicas 1997. Ministerio de Educación

Note: Includes teachers in both formal and nonformal education

Appendix 2.9: Teacher-to-Student Ratio by Level and by Department, 1997

	Initial	Primary	Secondary	Tertiary nonuniversity	Vocational training	Special	TOTAL
Amazonas	41	26	17	17	31	5	25
Ancash	43	26	17	20	21	13	24
Apurímac	40	28	20	19	17	5	27
Arequipa	43	26	20	19	25	6	24
Ayacucho	39	26	17	12	17	7	24
Cajamarca	45	29	19	20	28	7	27
Cusco	56	32	24	14	28	9	31
Huancavelica	48	30	19	17	18	5	28
Huánuco	36	32	21	17	27	7	29
Ica	39	29	19	15	35	7	25
Junín	40	28	18	14	31	7	24
La Libertad	39	31	18	16	30	8	26
Lambayeque	57	34	25	29	28	9	31
Lima - Callao	37	30	23	16	30	8	27
Loreto	35	29	21	19	26	5	27
Madre de Dios	25	25	19	15	17	4	22
Moquegua	27	19	15	15	28	6	18
Pasco	42	27	15	16	23	9	23
Piura	47	31	21	16	24	8	28
Puno	74	25	21	18	23	6	27
San Martín	30	27	20	16	21	6	25
Tacna	37	23	15	18	16	7	20
Tumbes	29	19	15	19	22	6	19
Ucayali	41	28	16	12	23	7	24
PERÚ	42	29	20	17	27	8	26

Source: Ministry of Education

Appendix 2.10 : Student Enrollment and Teachers in Public Pedagogical Institutes by Region, 1997

Department	Student Enrollment						Teachers			Number of pedagogical institutes
	First semester (1997)			Second semester (1997)			Total	with pedagogical studies	with no pedagogical studies	
	Total	Males	Females	Total	Males	Females				
Total Peru	**71883**	**29494**	**42389**	**66955**	**27099**	**39856**	**3726**	**3086**	**640**	**138**
Amazonas	1426	646	780	1378	634	744	68	61	7	3
Ancash	5324	2635	2689	5147	2512	2635	227	202	25	7
Apurímac	1584	778	806	1524	804	720	89	65	24	6
Arequipa	4319	1533	2786	3964	1375	2589	444	247	197	9
Ayacucho	3340	1506	1834	3237	1448	1789	166	125	41	7
Cajamarca	7157	3656	3501	6983	3577	3406	332	303	29	14
Callao	637	40	597	608	38	570	41	34	7	2
Cusco	3401	1630	1771	3296	1548	1748	251	223	28	11
Huancavelica	1261	608	653	1194	562	632	59	56	3	3
Huánuco	2333	985	1348	2241	954	1287	95	82	13	4
Ica	5830	1723	4107	3700	1164	2536	285	260	25	7
Junín	4849	1943	2906	4319	1746	2573	231	219	12	9
La Libertad	4822	1792	3030	4622	1685	2937	208	183	25	9
Lambayeque	2502	763	1739	2459	733	1726	127	106	21	3
Lima	5704	1071	4633	5491	1027	4464	303	253	50	9
Loreto	1525	657	868	1634	647	987	132	121	11	5
Madre de Dios	439	148	291	415	146	269	28	25	3	1
Moquegua	674	209	465	595	194	401	34	26	8	2
Pasco	851	476	375	1069	392	677	36	29	7	2
Piura	1689	460	1229	1782	496	1286	68	57	11	5
Puno	7249	4408	2841	6354	3513	2841	276	206	70	9
San Martín	2054	939	1115	2001	909	1092	97	90	7	6
Tacna	721	185	536	761	197	564	36	30	6	2
Tumbes	685	209	476	676	209	467	42	37	5	1
Ucayali	1507	494	1013	1505	589	916	51	46	5	2

Source: Ministry of Education, 1997. *Censo Nacional de Educacion Tecnica y Pedagogica* (Preliminary results)

Appendix 2.11: Student Enrollment and Teachers in Private Pedagogical Institutes by Region, 1997

Department	Student Enrollment						Teachers			Number of pedagogical institutes
	First semester (1997)			Second semester (1997)				with pedagogical studies	with no pedagogical studies	
	Total	Males	Females	Total	Males	Females	Total			
Total Peru	**45682**	**13907**	**31775**	**43422**	**13018**	**30404**	**3932**	**3339**	**593**	**180**
Amazonas	-	-	-	-	-	-	-	-	-	0
Ancash	2148	924	1224	1993	840	1153	220	200	20	15
Apurímac	-	-	-	-	-	-	-	-	-	0
Arequipa	3094	908	2186	2799	814	1985	204	185	19	10
Ayacucho	997	363	634	1078	413	665	70	35	35	3
Cajamarca	2379	908	1471	2226	813	1413	134	132	2	8
Callao	76	76	0	71	71	0	22	11	11	1
Cusco	4075	1263	2812	3421	1038	2383	324	259	65	14
Huancavelica	129	37	92	115	35	80	17	15	2	1
Huánuco	1033	444	589	921	340	581	105	93	12	4
Ica	3450	1124	2326	3152	1017	2135	224	206	18	8
Junín	2814	906	1908	2871	911	1960	277	253	24	16
La Libertad	4771	1412	3359	4205	1249	2956	405	327	78	19
Lambayeque	3145	757	2388	2996	701	2295	278	244	34	10
Lima	11756	2809	8947	12452	3053	9399	1135	949	186	42
Loreto	-	-	-	-	-	-	-	-	-	0
Madre de Dios	-	-	-	-	-	-	-	-	-	0
Moquegua	137	14	123	124	12	112	19	14	5	1
Pasco	-	-	-	-	-	-	-	-	-	0
Piura	1497	420	1077	1356	373	983	156	144	12	9
Puno	2371	1064	1307	2156	944	1212	223	173	50	11
San Martín	459	183	276	343	129	214	19	12	7	2
Tacna	573	127	446	530	112	418	45	43	2	2
Tumbes	156	42	114	143	39	104	13	11	2	1
Ucayali	622	126	496	470	114	356	42	33	9	3

Source: Ministry of Education, 1997. *Censo Nacional de Educacion Tecnica y Pedagogica*, (Preliminary results).

Appendix 2.12: Changes in Student Enrollment and Student-to-Teacher Ratios in Public Pedagogical Institutes by Region, 1997

Department	% Difference in Enrollment between First and Second Semester			Student-to-Teacher Ratio (total)		Teachers with Pedagogical Studies as % of Total	Average # of Students (1st and 2nd Semester) per Pedagogical Insitute
	Total	Males	Females	1st semester	2nd semester		
Total Peru	**-6.86%**	**-8.12%**	**-5.98%**	**19:1**	**18:1**	**82.82%**	**1006**
Amazonas	-3.37%	-1.86%	-4.62%	21:1	20:1	89.71%	935
Ancash	-3.32%	-4.67%	-2.01%	23:1	23:1	88.99%	1496
Apurímac	-3.79%	3.34%	-10.67%	18:1	17:1	73.03%	518
Arequipa	-8.22%	-10.31%	-7.07%	10:1	9:1	55.63%	920
Ayacucho	-3.08%	-3.85%	-2.45%	20:1	20:1	75.30%	940
Cajamarca	-2.43%	-2.16%	-2.71%	22:1	21:1	91.27%	1010
Callao	-4.55%	-5.00%	-4.52%	16:1	15:1	82.93%	623
Cusco	-3.09%	-5.03%	-1.30%	14:1	13:1	88.84%	609
Huancavelica	-5.31%	-7.57%	-3.22%	21:1	20:1	94.92%	818
Huánuco	-3.94%	-3.15%	-4.53%	25:1	24:1	86.32%	1144
Ica	-36.54%	-32.44%	-38.25%	20:1	13:1	91.23%	1361
Junín	-10.93%	-10.14%	-11.46%	21:1	19:1	94.81%	1019
La Libertad	-4.15%	-5.97%	-3.07%	23:1	22:1	87.98%	1049
Lambayeque	-1.72%	-3.93%	-0.75%	20:1	19:1	83.46%	1654
Lima	-3.73%	-4.11%	-3.65%	19:1	18:1	83.50%	1244
Loreto	7.15%	-1.52%	13.71%	12:1	12:1	91.67%	632
Madre de Dios	-5.47%	-1.35%	-7.56%	16:1	15:1	89.29%	854
Moquegua	-11.72%	-7.18%	-13.76%	20:1	18:1	76.47%	635
Pasco	25.62%	-17.65%	80.53%	24:1	30:1	80.56%	960
Piura	5.51%	7.83%	4.64%	25:1	26:1	83.82%	694
Puno	-12.35%	-20.30%	0.00%	26:1	23:1	74.64%	1511
San Martín	-2.58%	-3.19%	-2.06%	21:1	21:1	92.78%	676
Tacna	5.55%	6.49%	5.22%	20:1	21:1	83.33%	741
Tumbes	-1.31%	0.00%	-1.89%	16:1	16:1	88.10%	1361
Ucayali	-0.13%	19.23%	-9.58%	30:1	30:1	90.20%	1506

Source: Ministry of Education, 1997 *Censo Nacional de Educacion Tecnica y Pedagogica* (Preliminary results).

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Appendix 2.13: Changes in Student Enrollment and Student-to-Teacher Ratios in Private Pedagogical Institutes by Region, 1997

Department	% Difference in Enrollment between First and Second Semester			Student-to-Teacher Ratio (total)		Teachers with Pedagogical Studies as % of Total	Average # of Students (1st and 2nd Semester) per Pedagogical Institute
	Total	Males	Females	1st semester	2nd semester		
Total Peru	**-4.95%**	**-6.39%**	**-4.31%**	**12:1**	**11:1**	**84.92%**	**495**
Amazonas	-	-	-	-	-	-	-
Ancash	-7.22%	-9.09%	-5.80%	10:1	9:1	90.91%	276
Apurímac	-	-	-	-	-	-	-
Arequipa	-9.53%	-10.35%	-9.19%	15:1	14:1	90.69%	589
Ayacucho	8.12%	13.77%	4.89%	14:1	15:1	50.00%	692
Cajamarca	-6.43%	-10.46%	-3.94%	18:1	17:1	98.51%	576
Callao	-6.58%	-6.58%	-	3:1	3:1	50.00%	147
Cusco	-16.05%	-17.81%	-15.26%	13:1	11:1	79.94%	535
Huancavelica	-10.85%	-5.41%	-13.04%	8:1	7:1	88.24%	244
Huánuco	-10.84%	-23.42%	-1.36%	10:1	9:1	88.57%	489
Ica	-8.64%	-9.52%	-8.21%	15:1	14:1	91.96%	825
Junín	2.03%	0.55%	2.73%	10:1	10:1	91.34%	355
La Libertad	-11.86%	-11.54%	-12.00%	12:1	10:1	80.74%	472
Lambayeque	-4.74%	-7.40%	-3.89%	11:1	11:1	87.77%	614
Lima	5.92%	8.69%	5.05%	10:1	11:1	83.61%	576
Loreto	-	-	-	-	-	-	-
Madre de Dios	-	-	-	-	-	-	-
Moquegua	-9.49%	-14.29%	-8.94%	7:1	7:1	73.68%	261
Pasco	-	-	-	-	-	-	-
Piura	-9.42%	-11.19%	-8.73%	10:1	9:1	92.31%	317
Puno	-9.07%	-11.28%	-7.27%	11:1	10:1	77.58%	412
San Martín	-25.27%	-29.51%	-22.46%	24:1	18:1	63.16%	401
Tacna	-7.50%	-11.81%	-6.28%	13:1	12:1	95.56%	552
Tumbes	-8.33%	-7.14%	-8.77%	12:1	11:1	84.62%	299
Ucayali	-24.44%	-9.52%	-28.23%	15:1	11:1	78.57%	364

Source: Ministry of Education, 1997. *Censo nacional de Educacion Tecnica y Pedagogica*, (Preliminary results).

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APPENDIX 3

SCHOOL STATISTICS

Appendix 3.1: Public Schools for Formal and Nonformal Education (Disaggregated by Minors and Adults) by Level, 1990-1997

Levels and/or modalities	1990	1991	1992	1993	1994	1995	1996	1997	Rates of change 1990-1997
FORMAL	40,683	41,176	41,591	40,648	43,479	44,308	45,260	45,564	12.0%
NONFORMAL	13,885	14,328	14,566	15,073	16,045	17,562	23,536	19,199	38.3%
Initial education	20,712	21,628	22,096	20,987	24,288	26,093	32,609	28,435	37.3%
Formal	7,670	7,952	8,160	6,442	8,788	9,064	9,469	9,597	25.1%
Nonformal	13,042	13,676	13,936	14,545	15,500	17,029	23,140	18,838	44.4%
Primary education	26,896	26,814	26,862	27,309	27,586	27,947	28,263	28,385	5.5%
Minors	25,769	25,756	25,805	26,326	26,616	26,981	27,440	27,596	7.1%
Formal	25,718	25,717	25,767	26,302	26,593	26,963	27,434	27,580	7.2%
Nonformal	51	39	38	24	23	18	6	16	-68.6%
Adults	1,127	1,058	1,057	983	970	966	823	789	-30.0%
Formal	696	703	716	680	676	675	620	602	-13.5%
Nonformal	431	355	341	303	294	291	203	187	-56.6%
Secondary education	5,464	5,495	5,575	5,743	5,909	6,064	6,184	6,230	14.0%
Minors	4,550	4,620	4,704	4,901	5,067	5,231	5,403	5,476	20.4%
Formal	4,550	4,620	4,704	4,900	5,067	5,231	5,403	5,476	20.4%
Nonformal	0	0	0	1	0	0	0	0	-
Adults	914	875	871	842	842	833	781	754	-17.5%
Formal	741	749	753	746	744	739	716	689	-7.0%
Nonformal	173	126	118	96	98	94	65	65	-62.4%
Tertiary nonuniversity education	283	334	369	395	402	409	403	415	46.6%
University education	27	27	27	27	28	28	28	28	3.7%
Other	1,186	1,206	1,228	1,260	1,311	1,329	1,309	1,270	7.1%
Special education	310	307	318	330	354	359	380	356	14.8%
Formal	310	307	318	330	332	336	332	327	5.5%
Nonformal	0	0	0	0	22	23	48	29	-
Vocational education	876	899	910	930	957	970	929	914	4.3%
Formal	688	767	777	826	849	863	855	850	23.5%
Nonformal	188	132	133	104	108	107	74	64	-66.0%

Source: Ministry of Education

Appendix 3.2: Public Schools for Formal and Nonformal Education (Broadly Grouped) by Level as Percentage of Total, 1990-1997								
	1990	1991	1992	1993	1994	1995	1996	1997
Formal								
Initial education	18.85%	19.31%	19.62%	15.85%	20.21%	20.46%	20.92%	21.1%
Primary education	64.93%	64.16%	63.67%	66.38%	62.72%	62.38%	61.98%	61.9%
Secondary education	13.01%	13.04%	13.12%	13.89%	13.37%	13.47%	13.52%	13.5%
Tertiary nonuniversity education	0.70%	0.81%	0.89%	0.97%	0.92%	0.92%	0.89%	0.9%
University education	0.07%	0.07%	0.06%	0.07%	0.06%	0.06%	0.06%	0.1%
Others	2.45%	2.61%	2.63%	2.84%	2.72%	2.71%	2.62%	2.6%
TOTAL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.0%
Nonformal								
Initial education	93.93%	95.45%	95.67%	96.50%	96.60%	96.97%	98.32%	98.1%
Primary education	3.47%	2.75%	2.60%	2.17%	1.98%	1.76%	0.89%	1.1%
Secondary education	1.25%	0.88%	0.81%	0.64%	0.61%	0.54%	0.28%	0.3%
Others	1.35%	0.92%	0.91%	0.69%	0.81%	0.74%	0.52%	0.5%
TOTAL		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.0%

Source: Ministry of Education

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Appendix 3.3: Private Schools for Formal and Nonformal Education (Disaggregated by Minors and Adults) by Level, 1990-1997

Levels and/or modalities	1990	1991	1992	1993	1994	1995	1996	1997	Rates of change 1990-1997
FORMAL	6,305	6,870	7,860	10,559	12,566	13,740	15,129	15,676	148.6%
NONFORMAL	139	166	186	252	272	289	628	596	328.8%
Initial education	2,056	2,257	2,527	3,746	4,535	4,995	5,728	5,837	183.9%
Formal	1,979	2,196	2,484	3,672	4,489	4,936	5,461	5,632	184.6%
Nonformal	77	61	43	74	46	59	267	205	166.2%
Primary education	2,458	2,618	3,017	3,951	4,628	5,071	5,592	5,620	128.6%
Minors	2,405	2,548	2,945	3,871	4,534	4,978	5,425	5,442	126.3%
Formal	2,405	2,548	2,945	3,870	4,532	4,976	5,420	5,437	126.1%
Nonformal	0	0	0	1	2	2	5	5	-
Adults	53	70	72	80	94	93	167	178	235.8%
Formal	41	47	44	36	39	38	41	47	14.6%
Nonformal	12	23	28	44	55	55	126	131	991.7%
Secondary education	1,215	1,313	1,522	1,876	2,156	2,284	2,552	2,859	135.3%
Minors	1,122	1,181	1,359	1,689	1,931	2,050	2,270	2,530	125.5%
Formal	1,122	1,181	1,359	1,689	1,931	2,050	2,270	2,530	125.5%
Nonformal	0	0	0	0	0	0	0	0	-
Adults	93	132	163	187	225	234	282	329	253.8%
Formal	49	57	55	58	59	65	63	74	51.0%
Nonformal	44	75	108	129	166	169	219	255	479.5%
Tertiary nonuniversity education	164	192	234	291	374	425	501	550	235.4%
University education	19	19	22	24	24	24	29	29	52.6%
Other	532	637	724	923	1,121	1,230	1,355	1,377	158.8%
Special education	57	52	59	69	75	81	91	88	54.4%
Formal	57	52	59	69	75	81	91	88	54.4%
Nonformal	0	0	0	0	0	0	0	0	-
Vocational education	475	585	665	854	1,046	1,149	1,264	1,289	171.4%
Formal	469	578	658	850	1,043	1,145	1,253	1,289	174.8%
Nonformal	6	7	7	4	3	4	11	0	-100.0%

Source: Ministry of Education

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Appendix 3.4: Private Schools for Formal and Nonformal Education (Broadly Grouped) by Level as Percentage of Total, 1990-1997

	1990	1991	1992	1993	1994	1995	1996	1997
Formal								
Initial education	31.39%	31.97%	31.60%	34.78%	35.72%	35.92%	36.10%	35.9%
Primary education	38.79%	37.77%	38.03%	36.99%	36.38%	36.49%	36.10%	35.0%
Secondary education	18.57%	18.02%	17.99%	16.55%	15.84%	15.39%	15.42%	16.6%
Tertiary nonuniversity education	2.60%	2.79%	2.98%	2.76%	2.98%	3.09%	3.31%	3.5%
University education	0.30%	0.28%	0.28%	0.23%	0.19%	0.17%	0.19%	0.2%
Others	8.34%	9.17%	9.12%	8.70%	8.90%	8.92%	8.88%	8.8%
TOTAL	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.0%**
Nonformal								
Initial education	55.40%	36.75%	23.12%	29.37%	16.91%	20.42%	42.52%	34.4%
Primary education	8.63%	13.86%	15.05%	17.86%	20.96%	19.72%	20.86%	22.8%
Secondary education	31.65%	45.18%	58.06%	51.19%	61.03%	58.48%	34.87%	42.8%
Others	4.32%	4.22%	3.76%	1.59%	1.10%	1.38%	1.75%	0.0%
TOTAL	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.0%**

Source: Ministry of Education

Appendix 3.5: Total Public and Private Schools for Formal and Nonformal Education (Disaggregated by Minors and Adults) by Level, 1990-1997

Levels and/or modalities	1990	1991	1992	1993	1994	1995	1996	1997	Rates of change 1990-1997
FORMAL	46,988	48,046	49,451	51,207	56,045	58,048	60,389	61,240	30.3%
NONFORMAL	14,024	14,494	14,752	15,325	16,317	17,851	24,164	19,795	41.2%
Initial education	22,768	23,885	24,623	24,733	28,823	31,088	38,337	34,272	50.5%
Formal	9,649	10,148	10,644	10,114	13,277	14,000	14,930	15,229	57.8%
Nonformal	13,119	13,737	13,979	14,619	15,546	17,088	23,407	19,043	45.2%
Primary education	29,354	29,432	29,879	31,260	32,214	33,018	33,855	34,005	15.8%
Minors	28,174	28,304	28,750	30,197	31,150	31,959	32,865	33,038	17.3%
Formal	28,123	28,265	28,712	30,172	31,125	31,939	32,854	33,017	17.4%
Nonformal	51	39	38	25	25	20	11	21	-58.8%
Adults	1,180	1,128	1,129	1,063	1,064	1,059	990	967	-18.1%
Formal	737	750	760	716	715	713	661	649	-11.9%
Nonformal	443	378	369	347	349	346	329	318	-28.2%
Secondary education	6,679	6,808	7,097	7,619	8,065	8,348	8,736	9,089	36.1%
Minors	5,672	5,801	6,063	6,590	6,998	7,281	7,673	8,006	41.1%
Formal	5,672	5,801	6,063	6,589	6,998	7,281	7,673	8,006	41.1%
Nonformal	0	0	0	1	0	0	0	0	-
Adults	1,007	1,007	1,034	1,029	1,067	1,067	1,063	1,083	7.5%
Formal	790	806	808	804	803	804	779	763	-3.4%
Nonformal	217	201	226	225	264	263	284	320	47.5%
Tertiary nonuniversity education	447	526	603	686	776	834	904	965	115.9%
University education	46	46	49	51	52	52	57	57	23.9%
Other	1,718	1,843	1,952	2,183	2,432	2,559	2,664	2,647	54.1%
Special education	367	359	377	399	429	440	471	444	21.0%
Formal	367	359	377	399	407	417	423	415	13.1%
Nonformal	0	0	0	0	22	23	48	29	-
Vocational education	1,351	1,484	1,575	1,784	2,003	2,119	2,193	2,203	63.1%
Formal	1,157	1,345	1,435	1,676	1,892	2,008	2,108	2,139	84.9%
Nonformal	194	139	140	108	111	111	85	64	-67.0%

Source: Ministry of Education

Appendix 3.6: Total Public and Private Schools for Formal and Nonformal Education (Broadly Grouped) by Level as Percentage of Total, 1990-1997

	1990	1991	1992	1993	1994	1995	1996	1997
Forma								
Initial education	20.54%	21.12%	21.52%	19.75%	23.69%	24.12%	24.72%	24.9%
Primary education	61.42%	60.39%	59.60%	60.32%	56.81%	56.25%	55.50%	55.0%
Secondary education	13.75%	13.75%	13.89%	14.44%	13.92%	13.93%	14.00%	14.3%
Tertiary nonuniversity education	0.95%	1.09%	1.22%	1.34%	1.38%	1.44%	1.50%	1.6%
University education	0.10%	0.10%	0.10%	0.10%	0.09%	0.09%	0.09%	0.1%
Others	3.24%	3.55%	3.66%	4.05%	4.10%	4.18%	4.19%	4.2%
TOTAL	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	100.0%
Nonformal								
Initial education	93.55%	94.78%	94.76%	95.39%	95.27%	95.73%	96.87%	96.2%
Primary education	3.52%	2.88%	2.76%	2.43%	2.29%	2.05%	1.41%	1.7%
Secondary education	1.55%	1.39%	1.53%	1.47%	1.62%	1.47%	1.18%	1.6%
Others	1.38%	0.96%	0.95%	0.70%	0.82%	0.75%	0.55%	0.5%
TOTAL	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	100.0%

Source: Ministry of Education

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APPENDIX 4
INDICATORS OF EQUITY AND EFFICIENCY

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Appendix 4.1a: Rural Gross Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education level	FEMALE					MALE					ALL				
	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	40.61	97.21	74.34	26.23	68.52	49.85	91.94	75.04	29.21	67.72	45.71	94.59	74.70	27.77	68.11
Q2	54.19	97.15	80.32	20.78	68.87	43.02	96.34	78.27	27.21	66.66	48.13	96.77	79.24	23.79	67.76
Q3	53.39	97.35	83.86	26.44	70.99	57.85	97.17	91.87	46.37	78.81	55.52	97.26	88.22	36.87	75.07
Q4	60.47	99.12	81.03	28.79	68.87	55.89	98.72	85.15	51.27	78.94	58.09	98.89	83.29	37.92	74.08
Q5-richest	69.42	100.00	88.98	44.40	75.91	59.58	100.00	88.50	45.09	72.09	63.99	100.00	88.79	44.72	74.16
ALL	50.86	97.62	79.89	27.42	69.73	50.88	95.46	81.60	36.87	71.55	50.87	96.53	80.78	31.98	70.65

Source: Household Survey by Instituto Cuanto, 1997

Appendix 4.1b: Urban Gross Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education level	FEMALE					MALE					ALL				
	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	32.16	94.83	89.25	35.39	67.72	40.67	94.07	91.31	30.96	72.41	36.18	94.43	90.36	33.40	70.09
Q2	48.48	96.72	91.48	33.28	69.94	51.07	97.50	96.14	35.01	72.01	49.94	97.13	93.67	34.11	70.79
Q3	50.02	95.71	94.99	37.13	70.15	49.29	96.54	95.64	39.43	74.64	49.67	96.18	95.31	38.21	72.43
Q4	62.28	99.20	97.78	48.25	77.38	63.42	99.38	94.77	50.48	78.37	62.90	99.30	96.31	49.33	77.89
Q5-richest	62.43	99.20	94.39	70.04	82.98	66.14	98.72	98.05	64.73	81.48	64.29	98.97	96.19	67.35	82.24
ALL	51.15	97.17	93.83	46.58	73.82	54.53	97.21	95.18	46.79	75.90	52.90	97.19	94.50	46.48	74.87

Source: Household Survey by Instituto Cuanto, 1997

Appendix 4.1c: Rural Net Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education age group	FEMALE					MALE					ALL				
	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	4.83	66.76	20.59	1.62	33.39	9.34	56.05	17.73	2.45	28.90	7.28	61.39	19.15	2.02	31.11
Q2	7.07	67.68	29.82	0.86	32.73	8.87	70.19	23.78	1.76	31.75	8.03	68.90	26.65	1.29	32.24
Q3	13.42	64.91	24.30	3.88	34.38	14.84	67.07	41.75	2.28	39.19	14.13	66.03	33.48	3.03	36.88
Q4	26.06	65.69	31.80	8.51	35.76	6.18	70.58	44.96	10.64	43.45	16.65	68.45	39.03	9.37	39.67
Q5-richest	10.86	65.66	48.12	9.42	37.85	9.89	62.59	36.90	19.65	35.89	10.34	64.32	43.59	13.46	37.01
ALL	10.28	66.41	27.69	3.95	34.09	9.87	63.96	28.89	4.81	34.09	10.06	65.17	28.30	4.35	34.09

Source: Household Survey of Instituto Cuanto, 1997.

Appendix 4.1d : Urban Net Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education age group	FEMALE					MALE					ALL				
	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	3.57	70.20	34.46	11.45	35.20	6.66	62.05	40.29	7.43	37.04	4.98	65.70	37.48	9.52	36.14
Q2	9.24	71.12	56.27	9.70	39.83	15.94	71.36	55.96	12.52	42.44	13.01	71.25	56.13	11.04	41.14
Q3	14.23	75.38	57.37	19.78	43.76	6.70	64.11	50.33	14.27	40.01	10.81	69.04	53.85	17.26	41.88
Q4	12.64	70.78	64.75	23.52	46.91	22.28	72.50	66.56	18.48	48.20	18.00	71.70	65.65	21.07	47.57
Q5-richest	13.22	80.62	71.12	43.18	57.29	6.37	75.33	72.96	37.22	52.97	9.89	78.01	72.04	40.12	55.12
ALL	10.47	73.69	56.92	22.98	44.84	12.58	68.85	56.92	20.08	44.30	11.53	71.08	56.92	21.58	44.57

Source: Household Survey of Instituto Cuanto, 1997.

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Appendix 4.2a: Rural Public Gross Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education level	FEMALE					MALE					ALL				
	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	46.29	109.23	57.35	7.44	52.90	52.98	109.76	53.47	2.30	53.34	49.44	109.50	55.48	4.85	53.12
Q2	47.19	106.94	78.31	5.68	57.55	55.99	109.33	69.72	5.16	54.87	51.19	108.12	74.38	5.39	56.23
Q3	60.34	105.73	94.30	22.61	65.69	45.30	98.91	82.05	8.72	53.10	52.87	102.80	88.25	15.44	59.65
Q4	63.20	105.46	87.94	28.01	66.28	64.64	103.47	116.23	16.38	64.17	63.87	104.49	102.14	21.12	65.19
Q5-richest	56.94	127.91	69.84	28.74	54.63	116.22	117.62	80.34	26.36	68.57	84.34	121.21	75.65	27.67	61.99
ALL	50.12	107.99	71.83	12.91	57.50	55.05	107.88	69.66	6.94	55.35	52.43	107.94	70.79	9.77	56.43

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.2b: Urban Public Gross Enrollment Ratio by Gender, Age and Consumption Quintile, 1997

Education level	FEMALE					MALE					ALL				
	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	58.18	101.04	80.92	12.99	58.07	53.46	105.45	72.75	16.43	55.18	55.89	103.25	77.36	14.80	56.66
Q2	69.45	98.76	94.99	15.83	59.51	37.80	95.45	103.84	14.56	56.59	53.83	97.23	99.20	15.21	58.11
Q3	46.74	90.82	91.43	26.12	57.64	38.36	103.46	86.62	25.09	56.39	42.63	96.14	88.82	25.55	57.01
Q4	46.49	78.33	90.28	37.10	56.04	43.21	77.98	88.90	34.65	54.30	44.91	78.16	89.54	35.77	55.14
Q5-richest	26.70	55.20	74.89	50.16	50.47	35.00	59.01	69.67	39.74	46.29	30.55	57.11	72.34	44.94	48.41
ALL	48.29	84.10	87.20	32.85	56.03	40.48	86.36	85.93	29.11	53.47	44.51	85.16	86.56	30.89	54.75

Source: Household Survey by Instituto Cuanto, 1997.

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Appendix 4.2c: Rural Public Net Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education age group	FEMALE					MALE					ALL				
	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	9.74	83.50	37.40	5.78	39.50	12.47	85.25	34.03	2.30	40.49	11.03	84.40	35.77	4.03	39.99
Q2	10.86	84.43	58.24	5.09	45.19	15.09	89.46	49.91	5.16	44.18	12.79	86.91	54.44	5.13	44.69
Q3	15.08	91.54	56.54	15.11	51.15	21.50	76.12	59.63	8.72	41.67	18.27	84.90	58.07	11.81	46.60
Q4	19.13	92.23	62.66	23.54	54.72	13.31	90.85	72.01	14.36	49.74	16.43	91.55	67.35	18.11	52.15
Q5-richest	14.00	94.27	49.96	24.06	41.75	24.95	100.00	64.29	26.36	59.04	19.06	98.00	57.88	25.09	50.88
ALL	11.68	86.18	48.87	10.01	44.38	14.86	86.12	47.16	6.69	43.24	13.17	86.15	48.04	8.27	43.82

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.2d: Urban Public Net Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education age group	FEMALE					MALE					ALL				
	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	14.61	83.95	64.97	11.69	48.26	7.37	86.94	54.98	16.43	45.51	11.10	85.44	60.62	14.18	46.91
Q2	17.15	83.92	72.56	15.60	49.72	4.57	77.69	69.79	11.73	42.75	10.94	81.04	71.24	13.71	46.38
Q3	7.53	79.99	75.01	19.76	48.69	14.03	84.73	69.86	17.75	45.21	10.72	81.98	72.21	18.65	46.93
Q4	11.75	69.13	68.00	25.59	44.56	11.58	69.79	74.78	28.08	46.48	11.67	69.45	71.61	26.94	45.55
Q5-richest	5.49	52.10	60.80	34.39	39.90	7.17	53.11	55.88	30.07	37.80	6.27	52.61	58.40	32.23	38.86
ALL	10.80	73.53	68.68	24.04	45.85	9.44	73.14	66.92	22.67	43.39	10.14	73.35	67.80	23.32	44.62

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.3a: Rural Private Gross Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education level	FEMALE					MALE					ALL				
	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	0.36	0.23	0.35	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.19	0.11	0.18	0.00	0.08
Q2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Q3	0.00	0.00	5.32	0.00	1.03	2.63	4.48	0.00	0.00	1.35	1.31	1.93	2.69	0.00	1.18
Q4	0.00	0.00	2.92	0.00	0.71	0.00	1.20	0.00	0.00	0.35	0.00	0.59	1.45	0.00	0.52
Q5-richest	0.00	0.00	15.42	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.90	0.00	1.57
ALL	0.17	0.10	1.64	0.00	0.41	0.39	0.72	0.00	0.00	0.24	0.28	0.41	0.85	0.00	0.32

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.3b: Urban Private Gross Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education level	FEMALE					MALE					ALL				
	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All	Preschool	Primary	Secondary	Tertiary	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	0.00	0.00	1.30	0.00	0.35	0.00	1.41	1.68	0.00	0.81	0.00	0.00	1.47	0.00	0.58
Q2	4.18	3.87	2.43	0.00	1.73	6.23	7.64	2.68	1.14	3.17	5.19	5.61	2.55	0.56	2.42
Q3	5.67	7.58	6.61	0.51	4.48	4.77	4.24	5.61	1.40	3.26	5.22	6.17	6.06	1.00	3.86
Q4	14.13	18.75	18.10	2.68	10.58	13.87	21.04	13.49	3.16	9.50	14.01	19.85	15.65	2.94	10.03
Q5-richest	15.40	39.03	28.85	25.42	26.50	27.94	41.37	34.31	24.84	28.95	21.21	40.20	31.52	25.13	27.71
ALL	8.76	14.43	12.17	8.24	10.05	11.11	16.61	12.20	8.05	10.44	9.90	15.45	12.19	8.14	10.24

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.3c: Rural Private Net Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education age group	FEMALE					MALE					ALL				
	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	0.00	0.23	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.04
Q2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Q3	0.00	0.00	5.32	0.00	1.03	0.00	4.48	0.00	0.00	1.35	0.00	1.93	2.69	0.00	1.18
Q4	0.00	0.00	2.92	0.00	0.71	0.00	1.20	0.00	0.00	0.35	0.00	0.59	1.45	0.00	0.52
Q5-richest	0.00	0.00	10.28	0.00	2.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.60	0.00	1.05
ALL	0.00	0.10	1.33	0.00	0.34	0.00	0.72	0.00	0.00	0.24	0.00	0.41	0.69	0.00	0.29

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.3d: Urban Private Net Enrollment Ratio by Gender, Age, and Consumption Quintile, 1997

Education Age Group	FEMALE					MALE					ALL				
	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All	Preschool 3 to 5	Primary 6 to 11	Secondary 12 to 16	Tertiary 17 to 22	All
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Quintile															
Q1-poorest	0.00	0.00	1.30	0.00	0.35	0.00	1.41	1.68	0.00	0.81	0.00	0.70	1.47	0.00	0.58
Q2	0.00	3.28	2.43	0.00	1.56	0.00	6.96	2.68	1.14	2.98	0.00	4.98	2.55	0.56	2.24
Q3	3.36	7.58	5.71	0.51	4.29	2.59	4.24	4.21	1.40	2.91	2.98	6.17	4.90	1.00	3.59
Q4	4.13	18.07	14.27	2.68	9.59	1.16	20.37	11.22	3.16	8.83	2.70	19.17	12.65	2.94	9.20
Q5-richest	4.00	37.52	26.32	21.73	24.00	10.79	38.56	27.58	19.57	24.56	7.15	38.05	26.93	20.65	24.28
ALL	2.63	13.86	10.59	7.15	9.15	2.99	15.69	9.96	6.62	9.15	2.81	14.72	10.27	6.87	9.15

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.4a: Simulation 1 – Distribution of Public Expenditure by Consumption Quintile, 1997						
Quintile	Preprimary	Primary	Secondary	Nonuniversity	University	Total
			Enrollment			
Q1-poorest	278,534	1,069,606	282,818	13,932	8,273	1,653,164
Q2	238,944	976,715	399,087	26,144	12,178	1,653,068
Q3	178,470	817,723	398,787	29,280	38,153	1,462,413
Q4	161,117	586,191	430,363	48,503	53,660	1,279,834
Q5-richest	81,474	318,562	308,841	47,209	98,515	854,601
ALL	938,539	3,768,797	1,819,897	165,068	210,779	6,903,080
			Per Student public expenditure with pension (US $)			
	175	201	260	324	1255	
			Distribution of public expenditure by quintile (US$)			
Q1-poorest	48,743,491	214,990,882	73,532,703	4,513,935	10,382,515	352,163,526
Q2	41,815,196	196,319,768	103,762,584	8,470,783	15,283,031	365,651,362
Q3	31,232,233	164,362,266	103,684,696	9,486,860	47,882,034	356,648,089
Q4	28,195,487	117,824,334	111,894,507	15,714,826	67,343,387	340,972,541
Q5-richest	14,257,919	64,030,948	80,298,729	15,295,628	123,636,678	297,519,902
ALL	164,244,325	757,528,197	473,173,220	53,482,032	264,527,645	1,712,955,419
			Distribution of public expenditure by quintile (percentage)			
Q1-poorest	29.7%	28.4%	15.5%	8.4%	3.9%	20.6%
Q2	25.5%	25.9%	21.9%	15.8%	5.8%	21.3%
Q3	19.0%	21.7%	21.9%	17.7%	18.1%	20.8%
Q4	17.2%	15.6%	23.6%	29.4%	25.5%	19.9%
Q5-richest	8.7%	8.5%	17.0%	28.6%	46.7%	17.4%
ALL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.4b: Simulation 2 – Distribution of Public Expenditure by Consumption Quintile, 1997						
Quintile	Preprimary	Primary	Secondary	Nonuniversity	University	Total
			Enrollment			
Q1-poorest	278,534	1,069,606	282,818	13,932	8,273	1,653,164
Q2	238,944	976,715	399,087	26,144	12,178	1,653,068
Q3	178,470	817,723	398,787	29,280	38,153	1,462,413
Q4	161,117	586,191	430,363	48,503	53,660	1,279,834
Q5-richest	81,474	318,562	308,841	47,209	98,515	854,601
ALL	938,539	3,768,797	1,819,897	165,068	210,779	6,903,080
			Per student public expenditure without pension (US $)			
	127	148	191	238	1084	
			Distribution of public expenditure by quintile (US$)			
Q1-poorest	35,826,466	158,018,299	54,046,536	3,317,742	8,970,493	260,179,536
Q2	30,734,169	144,295,029	76,265,499	6,226,026	13,204,539	270,725,262
Q3	22,955,691	120,806,265	76,208,252	6,972,842	41,370,077	268,313,128
Q4	20,723,683	86,600,886	82,242,463	11,550,397	58,184,686	259,302,115
Q5-richest	10,479,570	47,062,746	59,019,566	11,242,287	106,822,090	234,626,259
ALL	120,719,579	556,783,225	347,782,317	39,309,294	228,551,885	1,293,146,299
			Distribution of public expenditure by quintile (percentage)			
Q1-poorest	29.7%	28.4%	15.5%	8.4%	3.9%	20.1%
Q2	25.5%	25.9%	21.9%	15.8%	5.8%	20.9%
Q3	19.0%	21.7%	21.9%	17.7%	18.1%	20.7%
Q4	17.2%	15.6%	23.6%	29.4%	25.5%	20.1%
Q5-richest	8.7%	8.5%	17.0%	28.6%	46.7%	18.1%
ALL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.4c: Simulation 3 – Distribution of Public Expenditure by Consumption Quintile, 1997

Quintile	Preprimary	Primary	Secondary	Nonuniversity	University	Total
			Enrollment			
Q1-poorest	278,534	1,069,606	282,818	13,932	8,273	1,653,164
Q2	238,944	976,715	399,087	26,144	12,178	1,653,068
Q3	178,470	817,723	398,787	29,280	38,153	1,462,413
Q4	161,117	586,191	430,363	48,503	53,660	1,279,834
Q5-richest	81,474	318,562	308,841	47,209	98,515	854,601
ALL	938,539	3,768,797	1,819,897	165,068	210,779	6,903,080
			Per student public expenditure varying across quintile with pension (US $)			
Q1 (0.7)	123	141	182	227	879	
Q2 (0.85)	149	171	221	275	1,067	
Q3 (1.0)	175	201	260	324	1,255	
Q4 (1.15)	201	231	299	373	1,443	
Q5 (1.3)	228	261	338	421	1,632	
			Distribution of public expenditure by quintile (US$)			
Q1-poorest	34,120,444	150,493,618	51,472,892	3,159,754	7,267,761	246,514,468
Q2	35,542,916	166,871,802	88,198,197	7,200,166	12,990,577	310,803,657
Q3	31,232,233	164,362,266	103,684,696	9,486,860	47,882,034	356,648,089
Q4	32,424,810	135,497,984	128,678,683	18,072,050	77,444,895	392,118,422
Q5-richest	18,535,294	83,240,232	104,388,348	19,884,316	160,727,681	386,775,872
ALL	151,855,697	700,465,902	476,422,817	57,803,146	306,312,947	1,692,860,509
			Distribution of public expenditure by quintile (percentage)			
Q1-poorest	22.5%	21.5%	10.8%	5.5%	2.4%	14.6%
Q2	23.4%	23.8%	18.5%	12.5%	4.2%	18.4%
Q3	20.6%	23.5%	21.8%	16.4%	15.6%	21.1%
Q4	21.4%	19.3%	27.0%	31.3%	25.3%	23.2%
Q5-richest	12.2%	11.9%	21.9%	34.4%	52.5%	22.8%
ALL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.4d: Simulation 4– Distribution of Public Expenditure by Consumption Quintile, 1997

Quintile	Preprimary	Primary	Secondary	Nonuniversity	University	Total
			Enrollment			
Q1-poorest	278,534	1,069,606	282,818	13,932	8,273	1,653,164
Q2	238,944	976,715	399,087	26,144	12,178	1,653,068
Q3	178,470	817,723	398,787	29,280	38,153	1,462,413
Q4	161,117	586,191	430,363	48,503	53,660	1,279,834
Q5-richest	81,474	318,562	308,841	47,209	98,515	854,601
ALL	938,539	3,768,797	1,819,897	165,068	210,779	6,903,080
			Per student public expenditure varying across quintile without pension (US $)			
Q1 (0.7)	90.04	103.41	133.77	166.70	759.02	
Q2 (0.85)	109.33	125.57	162.44	202.42	921.67	
Q3 (1.0)	128.63	147.74	191.10	238.14	1,084.32	
Q4 (1.15)	147.92	169.90	219.77	273.86	1,246.97	
Q5 (1.3)	167.21	192.06	248.43	309.58	1,409.62	
			Distribution of public expenditure by quintile (US$)			
Q1-poorest	25,078,526	110,612,809	37,832,575	2,322,420	6,279,345	182,125,675
Q2	26,124,043	122,650,775	64,825,674	5,292,122	11,223,858	230,116,473
Q3	22,955,691	120,806,265	76,208,252	6,972,842	41,370,077	268,313,128
Q4	23,832,235	99,591,018	94,578,832	13,282,957	66,912,389	298,197,432
Q5-richest	13,623,441	61,181,570	76,725,436	14,614,972	138,868,717	305,014,137
ALL	111,613,937	514,842,438	350,170,770	42,485,313	264,654,386	1,283,766,844
			Distribution of public expenditure by quintile (percentage)			
Q1-poorest	22.5%	21.5%	10.8%	5.5%	2.4%	14.2%
Q2	23.4%	23.8%	18.5%	12.5%	4.2%	17.9%
Q3	20.6%	23.5%	21.8%	16.4%	15.6%	20.9%
Q4	21.4%	19.3%	27.0%	31.3%	25.3%	23.2%
Q5-richest	12.2%	11.9%	21.9%	34.4%	52.5%	23.8%
ALL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.4e: Simulation 5 – Distribution of Public Expenditure by Consumption Quintile, 1997

Quintile	Preprimary	Primary	Secondary	Nonuniversity	University	Total
			Enrollment			
Q1-poorest	278,534	1,069,506	282,818	13,932	8,273	1,653,164
Q2	238,944	976,715	399,087	26,144	12,178	1,653,068
Q3	178,470	817,723	398,787	29,280	38,153	1,462,413
Q4	161,117	586,191	430,363	48,503	53,660	1,279,834
Q5-richest	81,474	318,562	308,841	47,209	98,515	854,601
ALL	938,539	3,768,797	1,819,897	165,068	210,779	6,903,080
			Per student public expenditure (US$)			
	175	201	260	324	3500	
			Distribution of public expenditure by quintile (US$)			
Q1-poorest	48,743,491	214,990,882	73,532,703	4,513,935	28,955,221	370,736,232
Q2	41,815,196	196,319,768	103,762,584	8,470,783	42,622,000	392,990,330
Q3	31,232,233	164,362,266	103,684,696	9,486,860	133,535,553	442,301,608
Q4	28,195,487	117,824,334	111,894,507	15,714,826	187,810,242	461,439,396
Q5-richest	14,257,919	64,030,948	80,298,729	15,295,628	344,803,484	518,686,708
ALL	164,244,325	757,528,197	473,173,220	53,482,032	737,726,500	2,186,154,274
			Distribution of public expenditure by quintile (percentage)			
Q1-poorest	29.7%	28.4%	15.5%	8.4%	3.9%	17.0%
Q2	25.5%	25.9%	21.9%	15.8%	5.8%	18.0%
Q3	19.0%	21.7%	21.9%	17.7%	18.1%	20.2%
Q4	17.2%	15.6%	23.6%	29.4%	25.5%	21.1%
Q5-richest	8.7%	8.5%	17.0%	28.6%	46.7%	23.7%
ALL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Household Survey by Instituto Cuanto, 1997.

Appendix 4.5: Water and Sanitation in Public and Private Schools by Age and Income Group, 1994

	6 to 11 Age Group						12 to 16 Age Group					
Quintile	Both	Neither	Only drainage	Only water	ALL	ALL	Both	Neither	Only drainage	Only water	ALL	ALL
						PUBLIC SCHOOLS						
Q1-poorest	61.34	22.94	1.62	14.08	100.00	643,397	69.32	17.31	0.65	12.70	100.00	480,969
Q2	70.35	17.28	1.52	10.83	100.00	549,940	76.66	13.67	1.46	8.19	100.00	478,102
Q3	75.52	14.33	0.95	9.18	100.00	390,693	83.89	7.74	0.61	7.73	100.00	436,591
Q4	77.55	11.24	1.41	9.78	100.00	359,016	87.56	8.07	0.70	3.65	100.00	397,799
Q5-richest	82.64	12.10	1.86	3.39	100.00	184,559	93.39	2.51	1.10	2.99	100.00	239,457
ALL	70.86	16.98	1.45	10.69	100.00	2,127,605	80.58	10.85	0.89	7.66	100.00	2,032,918
						PRIVATE SCHOOLS						
Q1-poorest	61.55	10.74	-	27.70	100.00	11,126	59.28	-	-	40.71	100.00	16,120
Q2	65.77	34.22	-	-	100.00	18,760	77.38	18.45	-	4.16	100.00	17,788
Q3	100.00	-	-	-	100.00	34,901	100.00	-	-	-	100.00	21,718
Q4	98.32	-	-	1.67	100.00	71,150	100.00	-	-	-	100.00	59,057
Q5-richest	99.16	-	-	0.83	100.00	143,370	99.17	-	0.82	-	100.00	182,423
ALL	95.31	2.72	-	1.95	100.00	279,307	95.93	1.10	0.50	2.45	100.00	297,106

Source: Household Survey by Instituto Cuanto, 1994

Appendix 4.6: Typology of Urban and Rural Schools, Based on School Characteristics, Infrastructure, Equipment, and Other Resources, Principals' and Teachers' Characteristics and Perceptions, 1994

Average number of cases	C.E very large urban	C.E large urban	C.E large rural	C.E medium urban	C.E medium rural	C.E small urban	C.E small rural	ANOVA F significance
SCHOOL CHARACTERISTICS								
Average number of teachers in each school	61.92	24.84	21.00	12.75	13.13	4.59	3.85	0.000
	62	93	10	83	8	49	34	
Average number of teachers at the time of the survey (in the relevant shift)	29.10	13.83	14.50	9.08	12.13	4.45	3.85	0.000
	59	94	12	86	8	49	34	
Total average enrollment	1682.17	732.99	664.57	333.98	285.33	109.79	96.26	0.000
	78	115	14	99	9	53	35	
Average enrollment in the shift	908.05	466.20	526.77	264.74	275.22	108.19	96.26	0.000
	58	98	13	96	9	53	35	
Average number of students per class	37.45	34.43	39.10	28.61	33.94	24.62	25.32	0.000
	56	96	13	93	9	52	34	
Average number of students in the observed 2nd grade class	32.17	29.77	26.45	24.91	28.00	15.48	12.94	0.000
	58	91	11	80	7	48	32	
INFRASTRUCTURE, EQUIPMENT AND OTHER RESOURCES								
% of schools with own installations	97.44%	85.96%	100.00%	71.13%	100.00%	83.02%	97.14%	0.000
	78	114	14	97	9	53	35	
% of schools with telephone	17.95%	12.17%	0.00%	6.06%	0.00%	0.00%	0.00%	0.001
	78	115	14	99	9	53	35	
% of schools with electricity	98.70%	97.35%	71.43%	88.66%	55.56%	54.72%	29.41%	0.000
	77	113	14	97	9	53	34	
% of schools with a room for teachers	64.94%	46.90%	21.43%	44.33%	0.00%	11.32%	11.76%	0.000
	77	113	14	97	9	53	34	
% of schools with a management office	75.32%	52.21%	28.57%	38.14%	11.11%	9.43%	17.65%	0.000
	77	113	14	97	9	53	34	
% of schools with an office of the principal	96.10%	91.15%	92.86%	95.88%	100.00%	64.15%	88.24%	0.000
	77	113	14	97	9	53	34	
% of schools with a library	80.52%	56.64%	42.86%	51.55%	22.22%	15.09%	26.47%	0.000
	77	113	14	97	9	53	34	
% of schools with a gym or sports area	70.13%	62.83%	57.14%	43.30%	0.00%	15.09%	35.29%	0.000
	77	113	14	97	9	53	34	
% of schools with classrooms with brick or cement walls	84.42%	68.70%	50.00%	60.82%	11.11%	43.40%	20.59%	0.000
	77	115	14	97	9	53	34	
% of schools with classrooms with floors (as opposed to dirt floor)	97.37%	99.12%	100.00%	94.85%	100.00%	92.45%	97.06%	0.319
	76	113	14	97	9	53	34	
% average of visited classes with complete walls	60.68%	60.40	56.48	66.67	33.33	52.06	60.61	0.342
	71	111	12	95	9	39	22	

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Appendix 4.6: (continued)

	C.E very large urban	C.E large urban	C.E large rural	C.E medium urban	C.E medium rural	C.E small urban	C.E small rural	
% average of visited classes with walls without cracks	99.43	99.26	90.89	97.04	97.22	95.01	97.06	0.042
	75	112	14	97	9	53	34	
% average of visited classes with roof	90.28	89.35	77.38	83.35	51.28	64.81	61.51	0.000
	75	112	14	96	9	53	34	
% average of visited classes with roof in good condition	99.51	98.87	100.00	98.30	97.22	99.25	99.58	0.734
	75	112	14	97	9	53	34	
% average of visited classes with glass in the windows	88.76	85.72	72.49	77.18	53.83	64.51	62.88	0.000
	75	112	14	96	9	53	34	
% average of visited classes without broken window glass	83.89	81.07	66.44	68.27	79.80	67.21	60.58	0.000
	75	112	14	96	9	53	34	
% average of visited classes with electricity	78.80	59.88	58.83	61.30	25.16	52.00	36.81	0.000
	75	112	14	96	9	53	34	
% average of latrines that work in observed schools	75.90	76.69	38.57	79.01	27.78	52.25	31.87	0.000
	75	112	14	96	9	53	34	
% average of classrooms in use	94.81	92.56	93.92	92.24	92.95	87.22	89.67	0.281
	77	113	14	96	9	52	34	
% average of students in observed 3rd grades who have text	17.71	15.80	10.18	10.45	1.57	4.48	4.28	0.000
	58	91	11	82	7	48	32	
% of teachers of 2nd grade with text books	100.00%	93.27%	91.67%	98.89%	100.00%	95.65%	90.91%	0.131
	62	104	12	90	8	46	33	
% of teachers of 2nd grade who have maps or other visual materials	86.89%	83.33%	91.67%	86.52%	87.50%	63.04%	69.70%	0.008
	61	102	12	89	8	46	33	
% of teachers of 2nd grade who have a slide projector	5.00%	2.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0.362
	60	100	11	85	7	44	32	
% of CE with maps or posters on the class walls	72.41%	72.92%	36.36%	65.88%	71.43%	68.75%	71.88%	0.321
	58	96	11	85	7	48	32	
Average number of visits made by USE to the teacher's class in the two last years	0.34	0.51	0.67	0.55	0.50	1.29	0.76	0.028
	61	103	12	86	8	38	25	
Average number of visits by USE to the school in the last year	1.34	1.08	0.92	1.11	0.43	1.33	0.52	0.117
	56	93	12	83	7	46	33	
% of directors that consider MED resources sufficient	2.63%	7.96%	0.00%	7.22%	0.00%	2.04%	0.00%	0.237
	76	113	14	97	8	49	34	
% of directors who consider that total CE resources are sufficient	3.85%	5.31%	0.00%	10.20%	0.00%	3.77%	2.94%	0.358
	78	113	14	98	9	53	34	
Annual APAFA Average Expenditure in CE (Soles)	11735.42	4813.42	2204.55	2797.93	422.89	431.29	278.06	0.000
	65	104	11	81	9	48	32	

Appendix 4.6: (continued)

CHARACTERISTICS OF THE DIRECTOR	C.E very large urban	C.E large urban	C.E large rural	C.E medium urban	C.E medium rural	C.E small urban	C.E small rural	
Average years of experience as a director	5.92	6.18	6.71	6.70	6.67	5.32	5.31	0.879
	78	115	14	99	9	53	35	
Average of years working in the actual CE	11.00	8.18	8.79	8.71	6.00	4.92	4.46	0.000
	78	115	14	99	9	53	35	
% of appointed directors	46.75%	50.88%	28.57%	41.24%	33.33%	26.42%	20.00%	0.006
	77	114	14	97	9	53	35	
% of directors with university education	58.97%	52.63%	57.14%	61.86%	11.11%	54.72%	51.43%	0.134
	78	114	14	97	9	53	35	
% of directors with academic degree or professional certificate	94.87%	97.35%	92.86%	94.90%	100.00%	90.57%	74.29%	0.000
	78	113	14	98	9	53	35	
% of directors formed in formation programs	88.46%	92.86%	85.71%	92.78%	66.67%	69.81%	68.57%	0.000
Regular	78	112	14	97	9	53	35	
Average number of training courses attended	5.85	6.77	6.93	5.68	3.56	3.74	3.60	0.066
	78	113	14	97	9	53	35	
Average age of directors	48.01	46.62	44.64	46.77	38.56	40.29	36.31	0.000
	76	115	14	98	9	52	35	
% of female directors	42.31%	40.87%	0.00%	44.44%	11.11%	54.72%	45.71%	0.007
	78	115	14	99	9	53	35	
% of directors satisfied or very satisfied with having decided to become a teacher	94.87%	92.11%	100.00%	94.95%	100.00%	94.34%	88.57%	0.664
	78	114	14	99	9	53	35	
CHARACTERISTICS OF 2ND GRADE TEACHERS								
Average years of experience as a teacher	10.58	10.49	10.00	10.77	10.25	9.20	8.67	0.630
	62	104	12	90	8	46	33	
Average years of permanency in the actual CE	5.85	4.41	5.08	5.22	2.25	3.26	3.61	0.000
	62	104	12	89	8	46	33	
% of appointed teachers	83.87%	83.65%	83.33%	87.64%	87.50%	82.22%	90.00%	0.952
	62	104	12	89	8	45	30	
% of teachers with university studies	59.68%	49.04%	33.33%	66.67%	14.29%	57.78%	50.00%	0.024
	62	104	12	90	7	45	32	
% of teachers with academic degree or professional certificate	80.65%	80.77%	83.33%	73.33%	85.71%	73.33%	50.00%	0.022
	62	104	12	90	7	45	32	
% of teachers formed in formation programs	85.25%	85.58%	41.67%	76.40%	57.14%	64.44%	53.13%	0.000
Regular	61	104	12	89	7	45	32	
Average number of training courses attended	8.48	7.33	6.67	8.39	6.57	6.28	6.35	0.637
	56	99	12	81	7	36	23	
Average teacher's age	35.84	34.65	35.92	36.22	31.75	35.09	34.61	0.646
	62	104	12	89	8	45	33	

Appendix 4.6: (continued)

	C.E very large urban	C.E large urban	C.E large rural	C.E medium urban	C.E medium rural	C.E small urban	C.E small rural	
% of female teachers	77.42%	83.65%	66.67%	77.78%	25.00%	78.26%	60.61%	0.002
	62	104	12	90	8	46	33	
% of teachers satisfied or very satisfied with having decided to become teachers	90.32%	90.38%	91.67%	90.00%	87.50%	89.13%	93.94%	0.995
	62	104	12	90	8	46	33	
Total income for working teachers	466.82	499.73	476.67	520.60	444.00	465.00	474.88	0.444
	62	104	12	88	8	45	33	
% average of teachers that the director would consider to contract again for this shift	59.74	65.79	69.25	65.79	56.76	67.66	68.94	0.775
	54	89	12	83	8	49	33	
% average of teachers that was finally terminated of those who the director intended to terminate	27.09	33.65	16.67	42.26	33.33	33.33	25.00	0.698
	39	51	8	42	6	9	8	
% of directors who rely on the teacher's capacity of his school	94.87%	93.91%	92.86%	93.94%	88.89%	100.00%	85.29%	0.207
	78	115	14	99	9	52	34	
% of teachers that believe that salary problems don't affect their good performance	29.51%	36.89%	41.67%	30.34%	25.00%	39.47%	28.00%	0.820
	61	103	12	89	8	38	25	
DIRECTORS' PERCEPTION ABOUT CLIMATE AND MANGEMENT OF THE SCHOOL								
% of directors that consider that there are no serious problems of indiscipline between teachers and students	69.23%	64.35%	57.14%	72.45%	88.89%	81.13%	82.86%	0.106
	78	115	14	98	9	53	35	
% of directors who think that CE provides an adequate environment for students to study	96.15%	77.39%	71.43%	67.68%	55.56%	56.60%	51.43%	0.001
	78	115	14	99	9	53	35	
% average of teachers commended or motivated this year	9.74	6.30	2.92	4.26	3.00	2.20	1.56	0.000
	78	114	13	99	9	51	34	
% of directors who think that students come to teachers for advice in pedagogical matters	97.44%	93.91%	100.00%	100.00%	100.00%	92.31%	88.24%	0.040
	78	115	14	99	9	52	34	
% of directors that normally seek the teachers' opinion before taking important decisions pertaining to the school	97.44%	96.52%	100.00%	96.97%	100.00%	100.00%	100.00%	0.732
	78	115	14	99	9	52	34	
% of directors that usually agree with the teachers in the pedagogical decisions that they make	52.56%	57.39%	42.86%	61.62%	88.89%	65.38%	64.71%	0.247
	78	115	14	99	9	52	34	
% of directors who believe they can avoid the teachers' late arrival or absence	33.77%	41.96%	61.54%	36.73%	33.33%	21.15%	32.35%	0.094
	77	112	13	98	9	52	34	
% of directors that think that teachers back them up in what they do	97.33%	96.49%	100.00%	97.98%	100.00%	96.15%	100.00%	0.881
	75	114	14	99	9	52	34	
% of directors that think there is not much conflict among teachers in his or her school	66.23%	66.37%	64.29%	82.83%	77.78%	92.31%	97.06%	0.000
	77	113	14	99	9	52	34	
% of directors that think that parents have the capacity to know what is best for their children's education	23.38%	22.61%	21.43%	21.21%	22.22%	15.09%	17.14%	0.932
	77	115	14	99	9	53	35	
% of directors who think they can make important changes in their schools	93.59%	93.86%	92.86%	90.91%	100.00%	100.00%	100.00%	0.210
	78	114	14	99	9	53	35	

Appendix 4.6: (continued)

	C.E Very Large Urban	C.E Large Urban	C.E Large Rural	C.E Medium Urban	C.E Medium Rural	C.E Small Urban	C.E Small Rural	
% of directors who think they are able to decide how to get funding for their schools	85.90% 78	95.65% 115	92.86% 14	93.94% 99	100.00% 9	92.45% 53	100.00% 35	0.083
% of directors who think they can select the teachers	66.67% 78	58.26% 115	50.00% 14	55.56% 99	66.67% 9	50.94% 53	48.57% 35	0.478
% of directors who think they can penalize the staff's absenteeism	93.51% 77	96.49% 114	92.86% 14	96.94% 98	100.00% 9	94.23% 52	91.43% 35	0.762
% of directors who think they can redistribute the number of hours assigned to each class	80.77% 78	78.26% 115	85.71% 14	80.61% 98	88.89% 9	83.02% 53	85.71% 35	0.940
% of directors who think they can modify the dates of start and close of the school year	48.72% 78	44.35% 115	42.86% 14	39.39% 99	55.56% 9	50.94% 53	51.43% 35	0.760
% of directors who think they can decide what goods the school could purchase	85.90% 78	93.04% 115	92.86% 14	87.88% 99	100.00% 9	90.57% 53	88.57% 35	0.643
PERCEPTION OF TEACHERS OF 2ND GRADE OF PRIMARY ON THE CLIMATE AND MANAGEMENT OF THE SCHOOL								
% of teachers who think they have liberty to be able to introduce innovations	88.71% 62	92.31% 104	75.00% 12	87.64% 89	100.00% 8	86.84% 38	76.00% 25	0.210
% of teachers who think the director consults their opinion for important decisions	91.94% 62	92.31% 104	83.33% 12	91.01% 89	100.00% 8	86.84% 38	87.50% 24	0.810
% of teachers who think the director contributes to pedagogical enhancement	33.87% 62	32.04% 103	25.00% 12	35.23% 88	25.00% 8	23.68% 38	20.83% 24	0.752
% of teachers that think that parents and teachers coincide on what is best for their children	82.26% 62	81.73% 104	83.33% 12	71.91% 89	100.00% 8	71.05% 38	64.00% 25	0.150
% of teachers who don't think there are many conflicts among teachers in their schools	66.13% 62	66.02% 103	41.67% 12	71.11% 90	50.00% 8	91.11% 45	84.38% 32	0.002
% of teachers who think that the director finds ways to stimulate or recognize their good performance	75.81% 62	79.61% 103	66.67% 12	79.78% 89	71.43% 7	71.05% 38	66.67% 24	0.714
% of teachers who think the director is always available to counsel or advise on pedagogical matters	96.77% 62	91.35% 104	66.67% 12	94.38% 89	75.00% 8	94.74% 38	91.67% 24	0.008
% of teachers who think the director is a leader of those who work in his or her school	70.49% 61	78.85% 104	66.67% 12	82.76% 87	62.50% 8	81.58% 38	72.00% 25	0.450
% of teachers who report that the updating or training in their school	30.65%	24.04%	8.33%	19.10%	0.00%	18.42%	8.33%	0.125

Appendix 4.6: (continued)

	C.E very large urban	C.E large urban	C.E large rural	C.E medium urban	C.E medium rural	C.E small urban	C.E small rural	
takes place with adequate frequency	62	104	12	89	8	38	24	
% of teachers that report that pedagogical material in their school	19.67%	18.27%	0.00%	15.73%	0.00%	10.53%	8.00%	0.325
is distributed with adequate frequency	61	104	12	89	8	38	25	
PEDAGOGICAL AND EFFICIENCY ASPECTS								
% of students of the period who graduated in 1993	93.68	92.27	91.70	92.35	85.12	87.15	83.38	0.000
	53	94	13	94	9	51	33	
% average of students of the period that attend in a typical day	96.02	95.45	95.62	93.36	93.85	91.91	85.86	0.000
of classes	57	96	13	92	9	53	34	
% average of students of the period that stay in the school	96.96	95.95	94.63	94.44	92.88	91.22	91.22	0.000
since the beginning of the school year	54	93	13	96	9	53	35	
% average of students of a section that the teacher thinks will	71.85	78.83	67.25	79.44	69.00	76.37	66.82	0.005
finish primary education	62	104	12	90	8	46	33	
% average of students of a section that the teacher thinks will	71.95	72.98	49.33	114.09	51.25	77.20	39.82	0.162
finish secondary education	62	104	12	90	8	46	33	
% of teachers of 2nd grade that think that the official curriculum	53.23%	38.24%	25.00%	46.67%	0.00%	28.26%	24.24%	0.004
is good	62	102	12	90	8	46	33	
% of teachers of 2nd grade that think that the official curriculum is not	29.03%	34.31%	58.33%	31.11%	87.50%	54.35%	72.73%	0.000
adequate to the regional and/or local realities	62	102	12	90	8	46	33	
% average of students who comply with their homework in the	79.98	74.76	66.83	75.48	72.50	68.78	71.19	0.106
2nd grade teacher's opinion	62	102	12	90	8	46	32	
% average of the official math curriculum of the 2nd grade which	85.98	83.94	79.50	84.22	70.63	81.13	73.70	0.000
comes to be completed within the school year	61	102	10	89	8	47	33	
% average of the official language curriculum of the 2nd grade which	85.25	84.61	78.18	83.74	71.25	79.00	73.45	0.000
comes to be completed within the school year	61	103	11	89	8	47	33	
Average number of weekly hours wasted in the period due to late	12.43	6.70	13.46	5.51	2.50	3.07	2.94	0.000
arrival or absence of teachers	68	101	14	90	8	47	33	
Average annual number of days that the school had to close,	3.32	2.39	3.08	1.62	6.00	2.92	5.59	0.000
excluding official holidays	78	114	12	99	9	53	34	

Source: Analysis of MED's Survey of Public Schools in Lima/Callao and Cusco, 1994 by Patricia Arregui and Sandro Marcone

Notes:

C.E. Very Large: more than 1,000 students

C.E. Large: between 501 and 1,000 students

C.E. Middle: between 201 and 500 students

C.E. Small: between 30 and 200 students

C.E. Urban: schools located in districts with more than 10,000 inhabitants or with less than 50% of the population economically active dedicated to agriculture.

C.E. Rural: schools located in districts with less than 10,000 inhabitants or with 50% or more of population economically active dedicated to agriculture.

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Appendix 4.7: Internal Efficiency of Public Education (Primary and Secondary) in Peru (Average 1994 to 1996)

Rates of Transition in Public Schools (average:1994/95-1996/97)

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11
Repetition	0.17	0.17	0.15	0.10	0.08	0.04	0.14	0.08	0.07	0.05	0.04
Promotion	0.79	0.80	0.82	0.87	0.88	0.93	0.81	0.85	0.86	0.89	0.92
Drop out	0.04	0.03	0.03	0.03	0.04	0.03	0.05	0.06	0.06	0.06	0.05

Flow of a Reconstructed Cohort

Year	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11	Graduated from G-11	Repetition by year	Drop out by year
1	1000												1000	44
2	167	790											957	32
3	28	266	630										924	31
4	5	67	303	517									892	31
5	1	15	97	299	449								861	30
6		4	26	109	296	395							830	28
7		1	7	32	119	277	367						803	34
8			2	9	38	116	307	296					768	39
9				3	11	38	150	273	253				728	42
10					4	12	56	144	252	218			686	40
11						4	19	57	142	230	195	179	647	36
12							7	20	60	135	212	195	434	22
13							1	8	21	59	129	118	218	10
14								2	9	21	58	53	90	5
15									3	9	21	19	33	1
16										3	9	8	12	
17											3	3	3	
Total												575	9886	425

Indicators of Internal Efficiency

	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11	Graduated from G-11	Total student-year
Student-year by grade	1201	1143	1065	969	917	842	907	800	740	675	627		9886
Promotion by grade	1000	949	912	873	841	807	783	732	683	639	603	576	8398
Desertion by grade	52	36	37	33	35	26	48	49	46	37	30	0	429
Repetition by grade	200	195	154	95	75	33	124	67	55	36	24	0	1034

Appendix 4.7: (continued)	
Primary education	
Percentage of students who reached Grade 6	81%
Percentage of students who reached Grade 6 without repeating	40%
Percentage of students who graduated to Grade 7	78%
Total percentage of drop out after primary education	22%
Secondary education	
Percentage of students who reached Grade 11	60%
Percentage of students who reached Grade 11 without repeating	20%
Percentage of which graduated from Grade 11	58%
Total percentage of drop-outs after secondary education	43%
Average number of years spent in the public education system	
Entire cohort	9.9
Those enrolled in Grade 6	7.3
Those enrolled in Grade 11	13.3
Dropouts	6.7
Student-years spent	
In primary education	7.6
In secondary education	16.4
Input-output ratio	
In primary education	1.3
In secondary education	1.4
In secondary education	1.4
Source: World Bank analysis of promotion repetition and dropout rates of MED.	

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APPENDIX 5

INTERNATIONAL COMPARISON OF

BETWEEN-SCHOOL VARIATION IN ACHIEVEMENT

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Appendix 5.1: International Comparison of Between-School Variation in Achievement by Selected Countries

Country (year of study)	% between schools	With pretest	After controlling for SES
Peru (1998)			
Math Grade 4	58		
Colombia (1992)			
Spanish Grade 1	18		
Spanish Grade 3	29		
Egypt (1992)			
Math Grade 5	60		59
Science Grade 5	41		41
Arabic Grade 5	53		51
Honduras (1992)			
Reading Grade 1	33		
Pakistan (1992)			
Math Grade 4	52		51
Science Grade 4	52		53
Math Grade 5	49		52
Science Grade 5	50		50
Thailand (1991a)			
Math Grade 3	31		
Thai Grade 3	35		
Thailand (1991b)			
Overall Grade 6	48		
Zimbabwe (1988)			
English Language Grade 7	42		
English Literature Grade 7	42		
Math Grade 7	42		
Zimbabwe (1991)			
English Grade 7	47		
Math Grade 7	60		
Zimbabwe (1992)			
English Grade 7	56		47
Math Grade 7	74		36
Botswana (1992)			
English Form II or Grade 8	12		
Math Form II or Grade 8	16		
Brazil (1990)			
Math Grade 9.	62		
Portuguese Grade 9.	36		
Egypt (1992)			
Math Grade 8	42		40
Science Grade 8	35		32
Arabic Grade 8	29		26
English Grade 8	43		39

Appendix 5.1: (continued)			
Philippines (1991)			
Math Grade 8	52		
Science Grade 8	43		
Thailand (1989)			
Math Grade 8	32	11	
Zimbabwe (1988) Grade 8			
English Form IV or Grade 10	42	27	21
English Literature Form IV	48	26	26
Math Form IV	44	23	18
Zimbabwe (1991)			
English Form II or Grade 8	65	47	
Math Form II or Grade 8	61	51	

Source: Table courtesy of Abby Rubin Riddell, 1993 data.

Appendix 5.2: International Comparison of Between-School Variance in IEA International Study on Reading, 1990

Participating country	9-year-old level	14-year-old level
Belgium (French)	16	40
Botswana	-	16
Canada (British Columbia)	21	27
Cyprus	13	15
Denmark	12	8
Finland	8	2
France	14	35
Germany (former West)	13	49
Germany (former East)	15	10
Greece	35	22
Hong Kong	33	43
Hungary	21	23
Iceland	9	8
Indonesia	37	-
Ireland	16	48
Italy	33	28
Netherlands	13	50
New Zealand	19	41
Nigeria	-	*
Norway	5	6
Philippines	-	61
Portugal	29	27
Singapore	22	52
Slovenia	10	12
Spain	18	22
Sweden	9	8
Switzerland	10	48
Thailand	-	66*
Trinidad and Tobago	32	58
United States	19	42
Venezuela	33	29
Zimbabwe	-	46*

Source: Andreas Schleicher and Jean Yip, Indicators of Between-School Differences in Reading Achievement, 1994, mimeo.

* Nigeria was excluded from the calculation because it did not provide sufficient information on the identification of schools and also because of insufficient sampling information. Thailand and Zimbabwe also did not meet the IEA sampling standards.

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APPENDIX 6

PUBLIC EXPENDITURE ON EDUCATION

Appendix 6.1: Gross Domestic Product, Total Government Expenditure, and Total Public Expenditure on Education, 1970-1997
(Million Soles in current prices)

Years	Gross Domestic Product	Total government expenditure	Public expenditure on education */	Public expenditure on education without pensions */	Revenues of central government	Public expenditure on education as % of GDP	Public exp. on education as % of total government expenditure	Total govt. expenditure as % of GDP	Central government revenues as % of GDP	Govt. expend. as % of revenues of central govt.	Public exp. on educ. as % of revenues of central gov.	Public exp. in educ. without pension as % of GDP	Public expenditure on education without pension as % of govt. expenditure.
	(1)	(2)	(3)	(4)	(5)	(3/1)	(3/2)	(2/1)	(5/1)	(2/5)	(3/5)	(4/1)	(4/2)
1970	0.00028	0.00005	0.00001	n.a.	n.a.	3.22	18.83	17.12	n.a.	n.a.	n.a.	n.a.	n.a.
1971	0.00031	0.00006	0.00001	n.a.	n.a.	3.11	16.84	18.44	n.a.	n.a.	n.a.	n.a.	n.a.
1972	0.00035	0.00007	0.00001	n.a.	n.a.	3.73	19.45	19.19	n.a.	n.a.	n.a.	n.a.	n.a.
1973	0.00041	0.00008	0.00001	n.a.	n.a.	3.59	17.86	20.09	n.a.	n.a.	n.a.	n.a.	n.a.
1974	0.00052	0.00010	0.00002	n.a.	n.a.	3.44	18.20	18.90	n.a.	n.a.	n.a.	n.a.	n.a.
1975	0.00067	0.00013	0.00002	n.a.	n.a.	3.28	16.62	19.75	n.a.	n.a.	n.a.	n.a.	n.a.
1976	0.00088	0.00018	0.00003	n.a.	n.a.	3.24	16.11	20.09	n.a.	n.a.	n.a.	n.a.	n.a.
1977	0.00119	0.00027	0.00004	n.a.	n.a.	3.00	13.38	22.39	n.a.	n.a.	n.a.	n.a.	n.a.
1978	0.00190	0.00043	0.00005	n.a.	n.a.	2.55	11.29	22.62	n.a.	n.a.	n.a.	n.a.	n.a.
1979	0.00349	0.00071	0.00008	n.a.	n.a.	2.19	10.75	20.38	n.a.	n.a.	n.a.	n.a.	n.a.
1980	0.00597	0.00137	0.00018	n.a.	n.a.	2.95	12.82	22.99	n.a.	n.a.	n.a.	n.a.	n.a.
1981	0.01066	0.00228	0.00033	n.a.	n.a.	3.06	14.32	21.37	n.a.	n.a.	n.a.	n.a.	n.a.
1982	0.01791	0.00363	0.00048	n.a.	n.a.	2.71	13.35	20.29	n.a.	n.a.	n.a.	n.a.	n.a.
1983	0.03245	0.00766	0.00089	n.a.	n.a.	2.75	11.66	23.61	n.a.	n.a.	n.a.	n.a.	n.a.
1984	0.07241	0.01696	0.00192	n.a.	n.a.	2.66	11.33	23.43	n.a.	n.a.	n.a.	n.a.	n.a.
1985	0.19790	0.04431	0.00494	n.a.	0.03	2.50	11.15	22.39	12.69	176.51	19.67	n.a.	n.a.
1986	0.37398	0.07669	0.01085	n.a.	0.04	2.90	14.16	20.51	11.07	185.23	26.22	n.a.	n.a.
1987	0.73944	0.13122	0.02485	n.a.	0.06	3.36	18.94	17.75	8.55	207.60	39.32	n.a.	n.a.
1988	4.94232	0.68087	0.10944	n.a.	0.38	2.21	16.07	13.78	7.74	177.91	28.60	n.a.	n.a.
1989	115.11473	17.34800	2.59661	n.a.	7.35	2.26	14.97	15.07	6.39	236.00	35.32	n.a.	n.a.
1990	6,789.94022	1,136.97100	150.86095	150.86	585.28	2.22	13.27	16.74	8.62	194.26	25.78	2.22	13.27
1991	32,937.32834	4,437.17000	737.44674	737.45	2,931.00	2.24	16.62	13.47	8.90	151.39	25.16	2.24	16.62
1992	52,060.93771	7,694.98100	1,227.87421	1,227.87	5,173.00	2.36	15.96	14.78	9.94	148.75	23.74	2.36	15.96
1993	80,010.14322	12,475.68800	2,080.73318	2,080.73	8,016.00	2.60	16.68	15.59	10.02	155.63	25.96	2.60	16.68
1994	109,315.76448	16,380.00000	3,080.56712	3,080.57	12,180.00	2.82	18.81	14.98	11.14	134.48	25.29	2.82	18.81
1995	132,598.96021	19,792.10000	4,188.69559	4,188.70	15,341.00	3.16	21.16	14.93	11.57	129.01	27.30	3.16	21.16
1996	149,780.37975	20,737.10000	4,291.16101	4,291.16	17,894.00	2.86	20.69	13.85	11.95	115.89	23.98	2.86	20.69
1997	171,375.00000	29,200.80000	5,150.26130	5,150.26	n.a.	3.01	17.64	17.04	n.a.	n.a.	n.a.	3.01	17.64
1998 /**	195,000.00000	29,524.00000	5,589.70000	n.a.	n.a.	2.87	18.93	15.14	n.a.	n.a.	n.a.	n.a.	n.a.

Notes: */ Include public expenditure in Ministry of Education, Regions, Universities, decentralized public institutions and PRES. **/ Preliminary

Source: (a) ME - OSPP/DIPP/UFIC - Aspectos Financieros de la educación Peruana, 1960 – 1979. (b) ME - OA / DIAF - Balances de Comprobación, 1980 - 1988. (c) ME - OSPP / DIPP - Calendarios de Compromiso, 1989. (d) MEF - OFINE - Calendarios de Compromiso por Sub Programas y Programas, 1990 - 1997. (e) INEI - Perú: Compendio Estadístico, 1993-1994. (f) INEI - Dirección Nacional de Cuentas Nacionales. (g) MEF - Presupuesto del Sector Público 1994-1997. (h) Memoria del BCRP 1995.

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Appendix 6.2: Gross Domestic Product, Total Government Expenditure, Total Public Expenditure on Education, and Tax Revenue of Central Government, 1970-1997 (Million Soles in Constant 1997 Prices)

Years	Gross Domestic Product (1)	Total Government expenditure (2)	Public expenditure on education (3)	Public exp. on education without pension (4)	Revenues of central government (5)	Total enrollment in public institutions ('000) (6)	Percentage Change (1)	(2)	(3)	(4)	(5)	Index of GDP
1970	92,825	15,895	2,993	n.a.	n.a.	2,891	4.24					0.000
1971	96,762	17,843	3,005	n.a.	n.a.	3,030	2.82	12.26	0.41			0.000
1972	99,489	19,092	3,714	n.a.	n.a.	3,194	5.43	7.00	23.58			0.000
1973	104,892	21,075	3,764	n.a.	n.a.	3,426	9.24	10.39	1.36			0.000
1974	114,588	21,663	3,942	n.a.	n.a.	3,583	3.37	2.79	4.72			0.000
1975	118,455	23,398	3,889	n.a.	n.a.	3,797	1.95	8.01	-1.34			0.000
1976	120,767	24,266	3,909	n.a.	n.a.	4,000	0.42	3.71	0.51			0.000
1977	121,270	27,157	3,633	n.a.	n.a.	4,140	0.28	11.92	-7.08			0.000
1978	121,615	27,505	3,105	n.a.	n.a.	4,285	5.81	1.28	-14.53			0.000
1979	128,677	26,227	2,819	n.a.	n.a.	4,318	4.46	-4.65	-9.20			0.000
1980	134,422	30,900	3,962	n.a.	n.a.	4,398	4.44	17.82	40.53			0.000
1981	140,393	30,006	4,296	n.a.	n.a.	4,812	0.21	-2.89	8.42			0.000
1982	140,694	28,541	3,809	n.a.	n.a.	5,107	-12.63	-4.88	-11.32			0.000
1983	122,926	29,027	3,385	n.a.	n.a.	5,146	4.82	1.70	-11.15			0.000
1984	128,845	30,185	3,421	n.a.	n.a.	5,346	2.27	3.99	1.09			0.000
1985	131,766	29,505	3,289	n.a.	16,716	5,475	9.24	-2.25	-3.88			0.000
1986	143,943	29,516	4,178	n.a.	15,935	5,700	8.47	0.04	27.04		-4.67	0.000
1987	156,128	27,705	5,248	n.a.	13,346	5,852	-8.35	-6.13	25.60		-16.25	0.000
1988	143,098	19,713	3,169	n.a.	11,081	6,035	-11.66	-28.85	-39.61		-16.97	0.003
1989	126,409	19,050	2,851	n.a.	8,072	6,233	-5.39	-3.37	-10.02		-27.15	0.091
1990	119,594	20,026	2,657	2,657	10,309	6,087	2.80	5.12	-6.81		27.71	5.678
1991	122,939	16,562	2,753	2,753	10,940	6,069	-1.63	-17.30	3.59	3.59	6.12	26.792
1992	120,940	17,876	2,852	2,852	12,017	6,053	6.61	7.93	3.63	3.63	9.85	43.047
1993	128,938	20,105	3,353	3,353	12,918	6,190	13.06	12.47	17.55	17.55	7.50	62.053
1994	145,776	21,843	4,108	4,108	16,242	6,322	7.24	8.65	22.51	22.51	25.74	74.989
1995	156,335	23,335	4,938	4,938	18,087	6,453	2.61	6.83	20.22	20.22	11.36	84.817
1996	160,410	22,209	4,596	4,596	19,164	6,569	6.84	-4.83	-6.94	-6.94	5.95	93.374
1997	171,375	29,201	5,150	5,150		6,620		31.48	12.07	12.07		100.000

Source: a) ME - OSPP/DIPP/UFIC - Aspectos Financieros de la educación Peruana, 1960 - 1979.

b) ME - OA / DIAF - Balances de Comprobación, 1980 - 1988.

c) ME - OSPP / DIPP - Calendarios de Compromiso, 1989

d) MEF - Dirección Nacional de Presupuesto Público - Calendarios de Compromiso por Sub Programas y Programas, 1990 – 1997

e) INEI - Perú: Compendio Estadístico, 1993-1994

Appendix 6.3: Gross Domestic Product, Total Government Expenditure, and Total Public Expenditure on Education, 1970-1997 (Million US dollars at the 1997 Exchange Rate)

Year	Gross Domestic Product	Expenditure of central government	Public expenditure on education	Recurrent expenditure on education	Capital expenditure on education
	(1)	(2)	(3)	(4)	(5)
1970	34,831.0	5,964.2	1,123.1	1,086.2	36.8
1971	36,308.4	6,695.2	1,127.7	1,088.2	39.5
1972	37,331.7	7,164.1	1,393.6	1,340.8	52.7
1973	39,359.2	7,908.2	1,412.5	1,354.8	57.7
1974	42,997.3	8,128.5	1,479.2	1,384.8	94.4
1975	44,448.4	8,779.6	1,459.5	1,402.8	56.6
1976	45,315.9	9,105.5	1,467.0	1,424.3	42.7
1977	45,504.9	10,190.4	1,363.1	1,323.3	39.8
1978	45,634.1	10,320.8	1,165.1	1,118.1	47.0
1979	48,284.0	9,841.1	1,057.9	1,017.5	40.5
1980	50,439.6	11,594.9	1,486.7	1,403.2	83.5
1981	52,680.3	11,259.3	1,611.9	1,536.1	75.8
1982	52,793.3	10,709.7	1,429.4	1,398.4	31.0
1983	46,126.1	10,891.8	1,270.1	1,248.6	21.5
1984	48,347.1	11,326.6	1,283.8	1,263.4	20.4
1985	49,443.3	11,071.2	1,234.1	1,201.3	32.8
1986	54,012.4	11,075.4	1,567.7	1,432.2	135.5
1987	58,584.7	10,396.0	1,969.1	1,862.4	106.6
1988	53,695.3	7,397.2	1,189.0	1,147.3	41.8
1989	47,432.9	7,148.2	1,069.9	1,017.4	52.6
1990	44,875.6	7,514.4	997.1	968.3	28.7
1991	46,130.8	6,214.5	1,032.8	940.6	92.2
1992	45,381.0	6,707.6	1,070.3	1,006.7	63.6
1993	48,382.1	7,544.0	1,258.2	1,123.5	134.7
1994	54,700.3	8,196.4	1,541.5	1,307.7	233.7
1995	58,662.2	8,756.1	1,853.1	1,568.3	284.8
1996	60,191.3	8,333.5	1,724.5	1,560.4	164.1
1997	64,305.8	10,957.1	1,932.6	1,734.6	198.0

Source: Ministry of Economy and Finance

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Appendix 6.4: Recurrent and Capital Expenditure on Education, 1990-1997 (Constant 1997 Soles)

Years	Total Expenditure	Recurrent Expenditure	Capital Expenditure	Percentages		Index of GDP
	(1=2+3)	(2)	(3)	(2)/(1)	(3)/(1)	
1970	2,992,929,996.38	2,894,790,273.45	98,139,722.93	96.72	3.28	0.000000302
1971	3,005,264,329.60	2,899,925,167.53	105,339,162.07	96.49	3.51	0.000000323
1972	3,713,882,819.18	3,573,362,183.26	140,520,635.92	96.22	3.78	0.000000348
1973	3,764,355,729.11	3,610,651,711.38	153,704,017.73	95.92	4.08	0.000000395
1974	3,942,098,683.83	3,690,601,434.39	251,497,249.44	93.62	6.38	0.000000456
1975	3,889,461,634.50	3,738,497,543.23	150,964,091.27	96.12	3.88	0.000000562
1976	3,909,489,799.42	3,795,697,494.72	113,792,304.70	97.09	2.91	0.000000725
1977	3,632,675,910.45	3,526,726,676.01	105,949,234.44	97.08	2.92	0.000000983
1978	3,104,928,455.58	2,979,687,428.92	125,241,026.66	95.97	4.03	0.000001563
1979	2,819,386,871.89	2,711,545,904.72	107,840,967.17	96.18	3.82	0.000002712
1980	3,962,000,862.59	3,739,594,950.01	222,405,912.58	94.39	5.61	0.00000444
1981	4,295,787,857.36	4,093,756,828.42	202,031,028.94	95.3	4.7	0.000007592
1982	3,809,483,279.78	3,726,798,546.90	82,684,732.88	97.83	2.17	0.000012729
1983	3,384,704,117.01	3,327,393,205.04	57,310,911.97	98.31	1.69	0.000026396
1984	3,421,448,012.79	3,367,088,022.90	54,359,989.89	98.41	1.59	0.000056199
1985	3,288,824,598.71	3,201,509,934.79	87,314,663.92	97.35	2.65	0.000150192
1986	4,178,012,206.15	3,816,805,651.24	361,206,554.91	91.35	8.65	0.000259808
1987	5,247,544,222.67	4,963,352,358.10	284,191,864.57	94.58	5.42	0.00047361
1988	3,168,766,165.26	3,057,491,622.22	111,274,543.04	96.49	3.51	0.003453802
1989	2,851,363,154.24	2,711,293,311.88	140,069,842.36	95.09	4.91	0.091065605
1990	2,657,167,015.60	2,580,549,605.23	76,617,410.37	97.12	2.88	5.677511128
1991	2,752,518,618.13	2,506,756,171.91	245,762,446.22	91.07	8.93	26.79170761
1992	2,852,420,824.38	2,682,818,235.95	169,602,588.43	94.05	5.95	43.04674102
1993	3,353,153,572.92	2,994,110,610.09	359,042,962.83	89.29	10.71	62.05302375
1994	4,108,042,988.56	3,485,108,506.54	622,934,482.03	84.84	15.16	74.98867786
1995	4,938,492,484.20	4,179,437,592.56	759,054,891.64	84.63	15.37	84.81729188
1996	4,595,691,835.04	4,158,395,903.39	437,295,931.65	90.48	9.52	93.37355866
1997	5,150,261,301.53	4,622,677,989.90	527,583,311.63	89.76	10.24	100

Source: a) ME - OSPP/DIPP/UFIC - Aspectos Financieros de la Educación Peruana, 1960 - 1979.
b) ME - OA / DIAF - Balances de Comprobación, 1980 - 1988.
c) ME - OSPP / DIPP - Calendarios de Compromiso, 1989
d) MEF - OFINE - Calendarios de Compromiso por Sub Programas y Programas, 1990 - 1994
e) ME - DE - Compendios Estadísticos

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Appendix 6.5: Public Expenditure on Education by Budgetary Entities, 1990-1997

Years	1990	1991	1992	1993	1994	1995	1996	1997
Soles in current prices								
Ministry of Education	106,468,236	270,857,363	432,244,400	701,802,523	662,584,313	909,878,575	1,008,270,540	1,273,214,580
Regional governments	26,149,124	341,435,429	630,246,688	1,039,197,022	1,643,154,842	2,188,322,218	2,308,072,053	2,755,236,125
Decentralized public institutions	2,440,284	27,793,583	18,715,687	21,740,112	35,176,190	58,788,997	85,091,738	100,496,386
Public universities	15,402,778	95,803,399	138,911,762	244,408,996	473,071,329	636,504,831	735,346,482	808,248,984
Ministry of the Presidency	400,530	1,556,966	7,755,668	73,584,527	266,580,449	395,200,964	154,380,199	213,065,227
Total	**150,860,952**	**737,446,740**	**1,227,874,205**	**2,080,733,180**	**3,080,567,123**	**4,188,695,585**	**4,291,161,012**	**5,150,261,302**
Soles in constant 1997 prices								
Ministry of Education	1,875,262,480	1,010,974,616	1,004,128,047	1,130,972,321	883,579,137	1,072,751,269	1,079,824,475	1,273,214,580
Regional governments	460,573,716	1,274,407,119	1,464,098,496	1,674,691,996	2,191,203,911	2,580,042,547	2,471,869,002	2,755,236,125
Decentralized public institutions	42,981,580	103,739,498	43,477,593	35,034,734	46,908,668	69,312,514	91,130,443	100,496,386
Public universities	271,294,545	357,586,013	322,699,834	393,871,211	630,857,007	750,442,294	787,531,816	808,248,984
Ministry of the Presidency	7,054,676	5,811,373	18,016,853	118,583,306	355,494,265	465,943,860	165,336,099	213,065,227
Total	**2,657,166,998**	**2,752,518,618**	**2,852,420,824**	**3,353,153,568**	**4,108,042,989**	**4,938,492,484**	**4,595,691,835**	**5,150,261,302**
Percentage of total								
Ministry of Education	70.6	36.7	35.2	33.7	21.5	21.7	23.5	24.7
Regional governments	17.3	46.3	51.3	49.9	53.3	52.2	53.8	53.5
Decentralized public institutions	1.6	3.8	1.5	1	1.1	1.4	2	2
Public universities	10.2	13	11.3	11.7	15.4	15.2	17.1	15.7
Ministry of the Presidency	0.3	0.2	0.6	3.5	8.7	9.4	3.6	4.1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: MEF/DNPP - Calendarios de Compromiso, 1990 - 1997

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Appendix 6.6 : Functional Composition of Public Expenditure on Education According to Pre-1997 Classification, 1990-1996

Years	1990	1991	1992	1993	1994	1995	1996
Soles in current prices							
01.00 Remuneration	66,361,732	254,906,854	345,152,256	374,873,347	468,943,068	559,041,342	609,092,112
02.00 Goods	4,425,802	18,395,348	25,721,017	70,700,676	109,516,456	161,082,946	136,044,821
03.00 Services	1,541,650	9,342,189	15,996,394	30,355,544	79,656,424	155,589,420	226,709,902
04.00 Recurrent transfer	49,961,296	282,108,974	602,495,265	1,186,097,430	1,714,268,776	2,375,598,820	2,585,955,065
05.00 Pensions	24,220,513	106,849,419	165,500,886	195,909,171	241,052,067	293,507,587	325,040,338
06.00 Interests and commissions						65,667	0
07.00 Studies	5,481	86,000		1,987,804	28,132,904	43,573,689	40,622,321
08.00 Works	1,913,770	17,954,923	23,084,821	146,213,058	382,806,236	475,157,344	262,577,233
09.00 Capital goods	262,179	14,787,297	2,454,841	18,956,888	48,311,348	68,115,761	75,736,255
10.00 Borrowing	1,411	47,600	27,500	84,579	358,210	2,378,393	4,497,041
11.00 Transfer of capital	2,164,621	32,968,136	32,861,825	53,932,758		10,000	60,000
14.00 E. of C. N.L.P.I.	2,500		14,579,400	1,621,928	7,521,634	54,574,616	24,825,924
Total	**150,860,953**	**737,446,740**	**1,227,874,205**	**2,080,733,183**	**3,080,567,123**	**4,188,695,585**	**4,291,161,012**
Soles in constant 1997 prices							
01.00 Remuneration	1,168,852,517	951,439,370	801,808,099	604,117,776	625,351,828	659,112,463	652,317,552
02.00 Goods	77,953,203	68,660,603	59,751,369	113,935,908	146,043,988	189,917,577	145,699,514
03.00 Services	27,153,617	34,869,703	37,160,523	48,918,718	106,224,601	183,440,684	242,798,824
04.00 Recurrent transfer	879,985,867	1,052,971,233	1,399,630,380	1,911,425,678	2,286,036,806	2,800,842,573	2,769,472,538
05.00 Pensions	426,604,406	398,815,262	384,467,865	315,712,530	321,451,283	346,046,874	348,107,475
06.00 Interests and commissions	0	0	0	0	0	77,422	0
07.00 Studies	96,537	320,995	0	3,203,396	37,516,202	51,373,591	43,505,165
08.00 Works	33,707,911	67,016,717	53,627,337	235,626,000	510,485,378	560,212,822	281,211,551
09.00 Capital goods	4,617,851	55,193,559	5,702,734	30,549,499	64,424,856	80,308,814	81,111,030
10.00 Borrowing	24,852	177,667	63,884	136,301	477,685	2,804,137	4,816,183
11.00 Transfer of capital	38,126,226	123,053,508	76,339,867	86,913,989	0	11,790	64,258
14.00 E. of C. N.L.P.I.	44,033	0	33,868,766	2,613,778	10,030,360	64,343,738	26,587,745
Total	**2,657,167,019**	**2,752,518,618**	**2,852,420,824**	**3,353,153,573**	**4,108,042,989**	**4,938,492,484**	**4,595,691,835**

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Appendix 6.6: (continued)

		1990	1991	1992	1993	1994	1995	1996
Percentage of total								
01.00 Remuneration		44	34.6	28.1	18	15.2	13.3	14.2
02.00 Goods		2.9	2.5	2.1	3.4	3.6	3.8	3.2
03.00 Services		1	1.3	1.3	1.5	2.6	3.7	5.3
04.00 Recurrent transfer		33.1	38.3	49.1	57	55.6	56.7	60.3
05.00 Pensions		16.1	14.5	13.5	9.4	7.8	7	7.6
06.00 Interests and commissions		0	0	0	0	0	0	0
07.00 Studies		0	0	0	0.1	0.9	1	0.9
08.00 Works		1.3	2.4	1.9	7	12.4	11.3	6.1
09.00 Capital goods		0.2	2	0.2	0.9	1.6	1.6	1.8
10.00 Borrowing		0	0	0	0	0	0.1	0.1
11.00 Transfer of capital		1.4	4.5	2.7	2.6	0	0	0
14.00 E. of C. N.L.P.I.		0	0	1.2	0.1	0.2	1.3	0.6
Total		100	100	100	100	100	100	100
Rate of change	Years	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1990-1996
01.00 Remuneration		-18.6%	-15.7%	-24.7%	3.5%	5.4%	-1.0%	-30.7%
02.00 Goods		-11.9%	-13.0%	90.7%	28.2%	30.0%	-23.3%	176.6%
03.00 Services		28.4%	6.6%	31.6%	117.1%	72.7%	32.4%	426.1%
04.00 Recurrent transfer		19.7%	32.9%	36.6%	19.6%	22.5%	-1.1%	166.0%
05.00 Pensions		-6.5%	-3.6%	-17.9%	1.8%	7.7%	0.6%	-13.2%
06.00 Interests and commissions								
07.00 Studies		232.5%	-100.0%	0.0%	1071.1%	36.9%	-15.3%	15904.5%
08.00 Works		98.8%	-20.0%	339.4%	116.7%	9.7%	-49.8%	735.9%
09.00 Capital goods		1095.2%	-89.7%	435.7%	110.9%	24.7%	1.0%	45.5%
10.00 Borrowing		614.9%	-64.0%	113.4%	250.5%	487.0%	71.8%	1478.3%
11.00 Transfer of capital		222.8%	-38.0%	13.9%	-100.0%	0.0%	445.0%	-100.0%
14.00 E. of C. N.L.P.I.		-100.0%	0.0%	-92.3%	283.7%	541.5%	-58.7%	0.0%
Total		3.6%	3.6%	17.6%	22.5%	20.2%	-6.9%	79.4%

Source: MEF/DNPP - Calendarios de Compromiso, 1990 – 1997

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Appendix 6.7: Reclassified Functional Composition of Public Expenditure on Education According to the 1997 Classification, 1990-1997

Years	1990	1991	1992	1993	1994	1995	1996	1997
Soles in current prices								
5.1 Personal cost and obligations (compensation)	95,838,896	421,351,149	700,624,462	1,074,670,831	1,480,361,646	1,960,644,646	2,134,805,601	2,941,364,687
5.2 Previous obligations (pensions)	43,705,418	216,871,919	400,474,039	658,487,169	909,616,890	1,219,991,127	1,333,562,813	1,078,918,396
5.3 Goods and services	5,967,451	27,737,537	41,717,411	101,056,220	189,172,880	316,672,366	362,754,723	509,213,129
5.4 Other recurrent expenditures	999,226	5,642,179	12,049,905	23,721,949	34,285,376	47,511,976	51,719,101	93,181,778
6.5 Investment	2,181,430	32,828,220	25,539,662	167,157,750	459,250,488	586,846,794	378,935,808	415,172,368
6.6 Financial investment	1,411	47,600	27,500	84,579	358,210	2,378,393	4,497,041	5,557,061
6.7 Other capital expenditures	2,167,121	32,968,136	47,441,225	55,554,686	7,521,634	54,650,283	24,885,924	106,853,883
Total	**150,860,953**	**737,446,740**	**1,227,874,205**	**2,080,733,183**	**3,080,567,123**	**4,188,695,585**	**4,291,161,012**	**5,250,816,075**
Soles in constant 1997 prices								
5.1 Personal cost and obligations (compensation)	1,688,044,178	1,572,692,397	1,627,590,024	1,731,858,926	1,974,113,544	2,311,609,581	2,286,306,350	2,941,364,687
5.2 Previous obligations (pensions)	769,798,894	809,474,043	930,323,713	1,061,168,544	1,213,005,637	1,438,375,477	1,428,201,765	1,078,918,396
5.3 Goods and services	105,106,820	103,530,306	96,911,892	162,854,626	252,268,590	373,358,261	388,498,338	509,213,129
5.4 Other recurrent expenditures	17,599,717	21,059,425	27,992,608	38,228,514	45,720,736	56,016,851	55,389,451	93,181,778
6.5 Investment	38,422,299	122,531,272	59,330,071	269,378,895	612,426,437	691,895,227	405,827,746	415,172,368
6.6 Financial investment	24,852	177,667	63,884	136,301	477,685	2,804,137	4,816,183	5,557,061
6.7 Other capital expenditures	38,170,259	123,053,508	110,208,633	89,527,766	10,030,360	64,432,950	26,652,003	106,853,883
Total	**2,657,167,019**	**2,752,518,618**	**2,852,420,824**	**3,353,153,573**	**4,108,042,989**	**4,938,492,484**	**4,595,691,835**	**5,150,261,302**
Percentage of total								
5.1 Personal cost and obligations (compensation)	67.7	63.3	65.6	60.9	56.8	55.6	59.1	56.8
5.2 Previous obligations (pensions)	24.8	23.2	24.1	22.4	20.8	20.4	21.7	21.6
5.3 Goods and services	4	3.8	3.4	4.9	6.1	7.6	8.5	9.8
5.4 Other recurrent expenditures	0.7	0.8	1	1.1	1.1	1.1	1.2	1.8
6.5 Investment	1.4	4.5	2.1	8	14.9	14	8.8	7.9
6.6 Financial investment	0	0	0	0	0	0.1	0.1	0.1
6.7 Other capital expenditures	1.4	4.5	3.9	2.7	0.2	1.3	0.6	2.0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix 6.7: (continued)								
Rates of changes	**1990-1991**	**1991-1992**	**1992-1993**	**1993-1994**	**1994-1995**	**1995-1996**	**1996-1997**	**1990-1997**
5.1 Personal cost and obligations (compensation)	-6.8	3.5	6.4	14	17.7	-1.1	28.7	74.2
5.2 Previous obligations (pensions)	-5.2	14.9	14.1	14.3	18.6	-0.7	-24.5	40.2
5.3 Goods and services	-1.5	-6.4	68	54.9	48	4.1	31.1	384.5
5.4 Other recurrent expenditures	19.7	32.9	36.6	19.6	22.5	-1.1	68.2	429.5
6.5 Investment	218.9	-51.6	354	127.3	13	-41.3	2.3	980.6
6.6 Financial investment	614.9	-64	113.4	250.5	487	71.8	15.4	22,260.20
6.7 Other capital expenditures	222.4	-10.4	-18.8	-88.8	542.4	-58.6	300.9	179.9
Total	**3.6**	**3.6**	**17.6**	**22.5**	**20.2**	**-6.9**	**12.1**	**93.8**

Source: MEPYDNPP – Calendarios de Compromiso, 1990 – 1997

Appendix 6.8: Functional Composition of Public Expenditure on Education by Budgetary Entities, 1995 -1997

	MED	INFES	Universities	Regions	Decentralized Public Institutions	TOTAL
1995						
5.1 Remuneration	57.6	0.5	44.4	68.2	34.5	55.4
5.2 Pension	21.3	0.2	16.4	25.2	12.8	20.5
5.3 Goods and services	14.7	0.0	19.8	1.9	26.6	7.6
5.4 Other current expenditures	1.2	0.0	0.4	1.5	0.8	1.1
6.5 Investment	0.0	99.2	18.0	3.1	20.3	14.0
6.6 Financial investment	0.0	0.0	0.0	0.0	4.0	0.1
6.7 Other capital expenditures	5.1	0.0	1.0	0.0	1.0	1.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
(Soles in current prices)	909,878,575.0	395,200,964.0	636,504,831.0	2,188,322,218.0	58,788,997.0	4,188,695,585.0
1996						
5.1 Remuneration	62.4	1.5	41.1	68.2	28.9	59.0
5.2 Pension	23.1	0.6	15.2	25.2	10.7	21.8
5.3 Goods and services	12.3	0.1	22.8	2.1	26.0	8.5
5.4 Other current expenditures	1.3	0.0	0.4	1.5	0.6	1.2
6.5 Investment	0.1	97.6	18.8	2.9	25.7	8.8
6.6 Financial investment	0.0	0.0	0.0	0.0	5.3	0.1
6.7 Other capital expenditures	0.8	0.3	1.7	0.1	2.9	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Soles in current prices	1,008,270,540.0	154,380,199.0	735,346,482.0	2,308,072,052.5	85,091,738.0	4,291,161,011.5
1997						
5.1 Remuneration	48.9	2.1	38.7	71.0	13.8	56.8
5.2 Pension	31.9	0.0	13.6	21.4	7.1	21.6
5.3 Goods and services	13.6	0.4	26.0	3.3	34.7	9.8
5.4 Other current expenditures.	0.2	0.3	8.9	0.1	16.4	1.8
6.5 Investment	4.4	78.0	8.1	3.7	19.4	7.9
6.6 Financial investment	0.0	0.0	0.0	0.0	5.5	0.1
6.7 Other capital expenditures	1.0	19.3	4.7	0.4	3.0	2.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Soles in current prices	1,273,214,580	213,065,227	808,248,984	2,865,790,898	100,496,386	5,260,816,075

Source: MEF/DNPP - Calendarios de Compromiso, 1990 - 1997

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Appendix 6.9: Public Expenditure on Education by Level, 1990-1997

Years	1990	1991	1992	1993	1994	1995	1996	1997
Soles in current prices								
Initial education	7,733,893	32,111,001	58,686,148	94,057,848	148,712,377	203,337,469	226,078,569	284,117,158
Primary education	40,791,358	161,362,221	296,107,972	480,980,342	719,310,676	961,137,528	1,048,724,737	1,398,613,025
Secondary education	30,300,217	115,488,352	214,220,096	344,710,338	512,958,213	685,959,743	768,086,960	958,899,509
Tertiary nonuniversity education	2,993,098	13,874,214	28,380,872	42,574,688	63,801,100	88,795,553	93,916,633	115,255,739
Vocational education	1,842,908	6,449,660	11,667,081	18,511,293	27,966,545	35,812,007	40,769,987	19,439,150
Special education	1,042,873	3,840,025	7,244,469	11,109,916	17,504,264	23,834,368	26,664,538	31,233,749
Literacy programs	1,032,020	4,977,281	8,252,521	11,298,131	18,652,939	22,585,648	22,059,850	0
Other/*	22,375	53,698	19,400	31,250	74,550	186,675	157,545	481,274
Administration	27,685,014	137,490,897	260,359,644	391,196,478	638,278,355	845,909,882	914,087,287	1,103,123,124
Universities	15,402,778	95,803,399	138,911,762	244,408,996	473,071,329	636,504,831	735,346,482	808,248,984
Inst. of Ministry of Education	19,173,604	136,645,443	177,552,885	312,483,949	64,943,865	162,654,057	108,480,201	0
Inst. of Education Sector	2,440,284	27,793,583	18,715,687	21,740,112	35,176,190	58,788,997	85,091,738	100,496,386
Other sectors /**	400,530	1,556,966	7,755,668	107,629,842	360,116,720	463,188,827	221,696,485	330,353,204
Total	150,860,952	737,446,740	1,227,874,205	2,080,733,183	3,080,567,123	4,188,695,585	4,291,161,012	5,150,261,302
Soles in Current 1997 Prices								
Initial education	136,219,777	119,854,253	136,331,222	151,576,575	198,313,107	239,735,866	242,122,687	284,117,158
Primary education	718,472,533	602,284,197	687,875,470	775,111,853	959,225,708	1,133,185,824	1,123,149,585	1,398,613,025
Secondary education	533,688,377	431,060,064	497,645,329	555,509,332	684,047,549	808,749,876	822,595,787	958,899,509
Tertiary nonuniversity education	52,718,488	51,785,479	65,930,362	68,610,175	85,080,977	104,690,389	100,581,614	115,255,739
Vocational education	32,459,787	24,073,344	27,103,285	29,831,412	37,294,357	42,222,531	43,663,311	19,439,150
Special education	18,368,489	14,332,886	16,829,309	17,903,908	23,342,543	28,100,836	28,556,840	31,233,749
Literacy programs	18,177,331	18,577,692	19,171,070	18,207,221	24,874,340	26,628,589	23,625,371	0
Other/*	394,099	200,428	45,067	50,360	99,415	220,091	168,725	481,274
Administration	487,625,887	513,184,523	604,830,094	630,422,910	851,166,300	997,331,869	978,957,319	1,103,123,124
Universities	271,294,545	357,586,013	322,699,834	393,871,211	630,857,007	750,442,294	787,531,816	808,248,984
Inst. of Ministry of Education	337,711,430	510,028,868	412,465,336	503,575,700	86,604,894	191,769,925	116,178,715	0
Inst. of Education Sector	42,981,580	103,739,498	43,477,593	35,034,734	46,908,668	69,312,514	91,130,443	100,496,386
Other sectors /**	7,054,676	5,811,373	18,016,853	173,448,183	480,228,123	546,101,882	237,429,620	330,353,204
Total	2,657,166,998	2,752,518,618	2,852,420,824	3,353,153,573	4,108,042,989	4,938,492,484	4,595,691,835	5,150,261,302

Appendix 6.9: (continued)								
Years	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
Percentage of total								
Initial education	5.1	4.4	4.8	4.5	4.8	4.9	5.3	5.5
Primary education	27	21.9	24.1	23.1	23.3	22.9	24.4	27.2
Secondary education	20.1	15.7	17.4	16.6	16.7	16.4	17.9	18.6
Tertiary nonuniversity education	2	1.9	2.3	2	2.1	2.1	2.2	2.2
Vocational education	1.2	0.9	1	0.9	0.9	0.9	1	0.4
Special education	0.7	0.5	0.6	0.5	0.6	0.6	0.6	0.6
Literacy programs	0.7	0.7	0.7	0.5	0.6	0.5	0.5	0
Other/*	0	0	0	0	0	0	0	0
Administration	18.4	18.6	21.2	18.8	20.7	20.2	21.3	21.4
Universities	10.2	13	11.3	11.7	15.4	15.2	17.1	15.7
Inst. of Ministry of Education	12.7	18.5	14.5	15	2.1	3.9	2.5	0
Inst. of Education Sector	1.6	3.8	1.5	1	1.1	1.4	2	2
Other sectors /**	0.3	0.2	0.6	5.2	11.7	11.1	5.2	6.4
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

*/ Extraescolar entre 1991-96, en 1997 asistencia a educandos, educación física y deportes y Cultura

**/ Incluye el gasto en INFES, CORDELICA y los gastos de capital ejecutados por los gobiernos regionales

Nota: A partir de 1997 los gastos en las instituciones del MED se reparten entre los niveles y modalidades

Source: MEF/DNPP – Calendarios de Compromiso, 1990 - 1997

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Appendix 6.10: Per Student Recurrent Public Expenditure by Level, 1990-1997

Years	1990	1991	1992	1993	1994	1995	1996	1997	Growth rate 1990-1997
Soles in 1997 Prices									
Initial education	275	256	291	298	381	440	415	468	70%
Primary education	287	260	301	320	398	461	449	536	87%
Secondary education	405	351	411	444	543	625	612	692	71%
Tertiary nonuniversity education	481	448	539	533	638	755	769	863	79%
University education	769	944	870	1286	2152	2464	2492	3232	335%
In 1997 US Dollars									
Initial education	103	96	109	112	143	165	156	175	n/a
Primary education	108	98	113	120	149	173	168	201	n/a
Secondary education	152	132	154	167	204	235	230	260	n/a
Tertiary nonuniversity education	181	168	202	200	239	283	288	324	n/a
University education	289	354	326	483	807	925	935	1255	n/a

Source: MEF/DNPP—Calendarios de Compromiso, 1990-1997 y Estadísticas Básicas del MED.

NOTE: Includes pensions.

Appendix 6.11: Recurrent Public Expenditure by Level, by Function, and by Department from Central Government Allocation, 1997

Department	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
Pension												
5.2	42,882,048	6,565,297	24,905,153	8,160,529	59,775,005	5,188,448	14,429,632	35176782	6,336,473	35,039,038	41,799,402	43,909,463
5.4	5,147		8,698									
Total	42,887,195	6,565,297	24,913,851	8,160,529	59,775,005	5,188,448	14,429,632	35,176,782	6,336,473	35,039,038	41,799,402	43,909,463
Administration												
5.1	2,936,828	474,969	3,440,557	542,535	3,284,924	202,256	731,144	1453201	248,052	1,002,900	915,182	3,210,007
5.3	827,387	202,470	1,885,768	484,382	3,126,368	59,303	126,700	511468	132,944	464,208	644,664	890,950
5.4	18,495	3,010	21,636	75,000						3,739		
6.5	150,000											
6.6												
6.7	77,773	33,847	180,000									200,000
Total	4,010,483	714,296	5,527,961	1,101,917	6,411,292	261,559	857,844	1,964,669	380,996	1,470,847	1,559,846	4,300,957
Planning												
5.1	52,824	50,029	664,842	703,580	967,149	475,104	476,682	2128030	354,947	1,965,147	802,669	716,669
5.3	44,957	28,969	106,438	429,535	633,007	48,130	74,500	363605	85,551	143,939	76,390	355,776
5.4	2,319											
6.3												
6.7				6,250								
Total	100,100	78,998	771,280	1,139,365	1,600,156	523,234	551,182	2,491,635	440,498	2,109,086	879,059	1,072,445
Initial education												
5.1	12,948,142	5,407,740	14,604,023	5,465,844	7,856,490	2,827,209	3,811,622	14904951	2,943,593	14,530,587	6,887,647	14,301,877
5.3	1,205,035	384,690	517,780	513,470	1,613,448	89,396	121,080	403130	404,264	2,582,375	1,381,374	98,825
5.4	24,230		19,654									
6.5												
6.7												
Total	14,177,407	5,792,430	15,141,457	5,979,314	9,469,938	2,916,605	3,932,702	15,308,081	3,347,857	17,112,962	8,269,021	14,400,702
Primary education												
5.1	77,415,477	15,426,863	64,586,636	27,019,956	45,858,167	9,809,792	13,693,270	81941018	12,034,363	99,072,220	43,685,588	73,002,833
5.3	1,742,919	189,670	927,434	485,069	1,156,687	378,467	512,398	978647	560,540	3,216,423	1,406,492	366,015
5.4	105,169		79,222									
6.5												
6.7												
Total	79,263,565	15,616,533	65,593,292	27,505,025	47,014,854	10,188,259	14,205,668	82,919,665	12,594,903	102,288,643	45,092,080	73,368,848
Secondary education												
5.1	53,456,924	13,908,622	37,856,057	17,878,936	41,868,312	9,304,497	14,611,508	57225685	6,906,950	49,445,673	33,336,861	33,657,209
5.3	193,023	103,873	386,032	163,134	25,360	140,846	279,838	567765	37,485	199,621	609,438	257,110
5.4	115,973		69,849									
6.3												
6.7												
Total	53,765,920	14,012,495	38,311,938	18,042,070	41,893,672	9,445,343	14,891,346	57,793,450	6,944,435	49,645,294	33,946,299	33,914,680
Tertiary education												361
5.1	6,103,533	1,020,504	3,775,643	2,372,913	6,213,685	1,710,710	1,758,142	7533529	966,291	7,969,606	4,279,832	3,562,285
5.2												
5.3	278,283	47,348	92,683	121,300		40,383	111,700	170041	110	47,132	42,181	112,214
5.4	13,000		14,501									
6.5												
6.7												
Total	6,394,816	1,067,852	3,832,827	2,494,213	6,213,685	1,751,093	1,869,842	7,703,570	966,401	8,016,738	4,322,013	3,674,499
Training												
5.1					106,509	252,321						
5.3					65,740	1,456						
5.4												
6.5												
6.7												
Total					172,249	253,777						
Special education												

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Appendix 6.11: (continued)

5.1	1,498,188	637,559	659,179	469,204	2,236,227		312,093	865768	131,251	1,031,357	638,807	832,797
5.3	38,925	14,133	3,687	31,497	2,080		12,000	71796	3,996	11,202	24,774	33,813
5.4	1,216		11,527									
6.5												
6.7												
Total	1,538,329	651,692	674,393	500,701	2,238,307		324,093	937,364	135,247	1,042,559	663,581	866,610
Assistance												
5.1					67,994							
5.3					62,690							
5.4												
6.5												
6.7												
Total					130,684							
Physical education												
5.1				34,653								
5.3				7,100								
5.4												
6.5												
6.7				30,000								
Culture				71,753								
5.1				16,162								
5.3				28,590								
5.4												
6.5												
6.7												
Total				44,752								
Military College												
5.1					1,010,144							
5.3					1,361,667						559,045	
5.4											912,047	
6.5												
6.7												
Total					2,371,811						1,471,092	

Department aggregate	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
5.1	154,411,916	36,926,286	125,536,937	54,503,783	109,469,601	24,581,889	35,394,461	166,052,182	23,585,447	175,017,490	91,105,631	129,283,677
5.2	42,882,048	6,565,297	24,905,153	8,160,529	59,775,005	5,188,448	14,429,632	35,176,782	6,336,473	35,039,038	41,799,402	43,909,463
5.3	4,330,529	971,153	3,919,822	2,264,077	8,047,047	757,981	1,238,216	3,066,452	1,224,890	6,664,900	5,097,360	2,114,703
5.4	285,549	3,010	225,087	75,000						3,739		
6.5	150,000											
6.6												200,361
6.7	77,773	33,847	180,000	36,250								
Total	202,137,815	44,499,593	154,766,999	65,039,639	177,291,653	30,528,318	51,062,309	204,295,416	31,146,810	216,725,167	138,002,393	175,508,204

Source: MEF/DNPP—Calendarios de Compromiso

Appendix 6.11: (continued)

Department	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Total
Pension												
5.2	11421581	1,680,020	14,697,274	21,931,141	35,703,279	7,789,460	17,612,609	5,458,919	53,888,645	40,440,064	20,908,096	555,698,358
5.4										10,420		24,265
Total	**11,421,581**	**1,680,020**	**14,697,274**	**21,931,141**	**35,703,279**	**7,789,460**	**17,612,609**	**5,458,919**	**53,888,645**	**40,450,484**	**20,908,096**	**555,722,623**
Administration												
5.1	2691208	405,161	1,003,894	3,754,053	2,529,082	1,439,518	621,938	709,528	724,441	2,759,659	1,119,927	36,200,964
5.3	389350	129,363	477,177	564,870	521,623	722,608	375,866	373,506	805,202	572,262	403,099	14,691,538
5.4	8414		810				68,872	40,000	95,170		46,291	381,437
6.5										5,400		155,400
6.6												
6.7	12078		13						35,000	55,000		593,711
Total	**3,101,050**	**534,524**	**1,481,894**	**4,318,923**	**3,050,705**	**2,162,126**	**1,066,676**	**1,123,834**	**1,659,813**	**3,392,321**	**1,569,317**	**52,023,050**
Planning												
5.1	247256	92,070	664,784	533,354	396,195	637,940	456,225	378,346	137,079	2,914,811	919,245	16,734,977
5.3	131972	44,443	22,424	101,675	21,298	161,477	131,072	78,788	36,336	381,100	342,251	3,843,633
5.4							16,000					18,319
6.5												
6.7											532	6,782
Total	**379,228**	**136,513**	**687,208**	**635,029**	**417,493**	**799,417**	**603,297**	**457,134**	**173,415**	**3,295,911**	**1,262,028**	**20,603,711**
Initial education												
5.1	6012739	1,770,422	5,275,336	7,561,468	7,992,759	5,401,853	5,617,261	4,439,199	9,645,356	13,171,390	8,747,287	182,144,795
5.3	242014	68,013	576,093	468,367	511,362	453,529	991,485	879,758	1,229,753	857,655	733,580	16,326,476
5.4										9,480		53,364
6.5												
6.7												
Total	**6,254,753**	**1,838,435**	**5,851,429**	**8,029,835**	**8,504,121**	**5,855,382**	**6,608,746**	**5,318,957**	**10,875,109**	**14,038,525**	**9,480,867**	**198,524,635**
Primary education												
5.1	31524074	6,089,880	41,046,343	46,390,001	31,808,754	33,000,244	43,283,173	17,647,761	69,919,143	70,259,200	43,645,516	998,160,272
5.3	577030	206,504	649,275	1,339,895	405,354	979,335	1,541,404	987,651	1,566,739	1,216,801	944,759	22,335,508
5.4										11,490		195,881
6.5												
6.7			22									22
Total	**32,101,104**	**6,296,384**	**41,695,640**	**47,729,896**	**32,214,108**	**33,979,579**	**44,824,577**	**18,635,412**	**71,485,882**	**71,487,491**	**44,590,275**	**1,020,691,683**
Secondary education												
5.1	15047815	3,736,113	24,542,162	24,429,814	35,348,778	14,858,481	21,738,275	14,172,554	52,731,293	51,626,277	21,441,162	649,129,958
5.3	209168	203,601	96,224	257,067	263,054	180,976	357,935	192,428	462,980	472,380	1,087,260	6,746,598
5.4										8,910	16,600	211,332
6.5												
6.7			120									481
Total	**15,256,983**	**3,939,714**	**24,638,506**	**24,686,881**	**35,611,832**	**15,039,457**	**22,096,210**	**14,364,982**	**53,194,273**	**52,107,567**	**22,545,022**	**656,088,369**
Tertiary education												
5.1	1520383	584,262	3,525,764	4,707,833	4,112,810	1,731,958	2,871,234	2,768,414	7,074,497	6,750,109	3,050,278	85,914,215
5.2												
5.3	75445	39,230	22,719	69,216	109,532	3,116	98,424	29,845	93,068	129,242	156,618	1,889,830
5.4												27,501
6.5												
6.7			140									140
Total	**1,595,828**	**623,492**	**3,548,623**	**4,777,049**	**4,222,342**	**1,735,074**	**2,969,658**	**2,798,259**	**7,167,565**	**6,879,351**	**3,206,896**	**87,831,686**
Training												
5.1												
5.3							29,670	24,571	19,134			432,205
5.4							71,554	10,101	54,000			202,851
6.5												
6.7												
Total							**101,224**	**34,672**	**73,134**			**635,056**

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Appendix 6.11: (continued)

Department	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Total
Special education												
5.1	260868	81,479	269,902	531,526	811,643	246,196	325,494	386,749	905,718	1,140,573	525,239	14,797,817
5.3	33062	7,261	14,170	12,914	38,063	2,302	21,907	8,672	27,772	25,314	141,539	581,079
5.4												12,743
6.5												
6.7			7									7
Total	293,930	88,740	284,079	544,440	849,706	248,498	347,401	395,421	933,490	1,165,887	666,778	15,391,646
Assistance												
5.1												67,994
5.3												62,690
5.4												
6.5												
6.7												
Total												130,684
Physical education												
5.1							17,207	94,086	35,879			181,825
5.3							50,298	15,415	21,200			94,013
5.4												
6.5												
6.7												30,000
Total							67,505	109,501	57,079			305,838
Culture												
5.1												16,162
5.3												28,590
5.4												
6.5												
6.7												
Total												44,752
Military College												
5.1			490,485									2,059,674
5.3			1,198,129									3,471,843
5.4			50									50
6.5												
6.7			24,000									24,000
Total			1,712,664									5,555,567

Department aggregate	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Total
5.1	57,304,343	12,759,387	76,818,670	87,908,049	83,000,021	57,316,190	74,960,477	40,641,208	141,192,540	148,622,019	79,448,654	1,985,840,858
5.2	11,421,581	1,680,020	14,697,274	21,931,141	35,703,279	7,789,460	17,612,609	5,458,919	53,888,645	40,440,064	20,908,096	555,698,358
5.3	1,658,041	698,415	3,056,211	2,814,004	1,870,286	2,503,543	3,639,945	2,576,164	4,297,050	3,654,754	3,809,106	70,274,649
5.4	8,414		860				84,872	40,000	95,170	40,300	62,891	924,892
6.5										5,400		155,400
6.6												
6.7	12,078		24,302						35,000	55,000	532	655,143
Total	70,404,457	15,137,823	94,597,317	112,653,194	120,573,586	67,609,193	96,297,903	48,716,291	199,508,405	192,817,537	104,229,279	2,613,549,300

Source: MEF/DNPP—Calendarios de Compromiso

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Appendix 6.12: Recurrent Public Expenditure by Level, by Function and by Department from Own Resources, 1997

Department	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
Pension												
5.2												
5.4												
Total												
Administration												
5.1	49,000			13,500			41,867			108,838		
5.3	818,175	47,581	281,662	58,800	4,897,259	133,974	45,000	71220	23,138	290,619	634,434	274,776
5.4	176,337		139,315	25,000	37,101			2000	19,052	19,999		
6.3					383,003							
6.6					6,000							
6.7	119,431		41,985		500,789		23,000	61663		179,663	264,379	249,636
Total	1,162,943	47,581	462,962	97,300	6,126,152	133,974	109,867	134,883	41,190	599,119	898,763	524,412
Planning												
5.1												
5.3	12,000						49,867	1000				
5.4							36,000	49558	16,691	28,000	75,989	
6.5												
6.7								108860				
Total	12,000						22,000	18515				
Initial education							107,867	177,933	16,691	28,000	75,989	
5.1												
5.3												
5.4				57,450				16500				
6.5				2,800								
6.7												
Total												
Primary education				60,250				16,500				
5.1												
5.3												
5.4				58,550				78800				
6.3				750								
6.7												
Total												
Secondary education				59,300				78800				
5.1												
5.3												
5.4				440,350		138,258		145300				
6.5				32,100								
6.7												
Total												
Tertiary education				472,450		138,258		145,300				
5.1	203,400											
5.2												
5.3	1,025,333	455,852		873,259		230,683		349463			635,673	
5.4	5,000	23,848		151,187								
6.5	88,316											
6.7	361,150	74,920										
Total	1,683,199	554,620		1,024,446		230,683		279309			65,400	
Training								425772			701,073	
5.1												

Source: MEF/DNPP—Calendarios de Compromiso

Appendix 6.12: (continued)

Department	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	CORDELICA	Total
Pension													
5.2													
5.4													
Total													
Administration													
5.1			21,000		20,358								
5.3	95088	8,480	10,500	93,157	92,478	8,954	8954	17,262	258,240	193,609	162,039		254,543
5.4													8,524,399
6.5													418,804
6.6	40100												385,003
6.7	132443	19,250		60,280	31,070	17,270	17270	74,660	176,196	2,804 33,563	67,701		48,904 2,370,199
Total	**267,631**	**27,730**	**31,500**	**153,437**	**143,906**	**26,224**	**26,224**	**91,922**	**434,436**	**229,976**	**229,740**		**12,001,872**
Planning													
5.1													
5.3				9,240		6,033	6033						80,867
5.4										7,215	124,317		371,076
6.5										855			855
6.7						16,000	16000						108,860
Total				**9,240**		**22,033**	**22,033**			**8,070**	**126,267**		**74,465 606,123**
Initial education													
5.1													
5.3	35345												
5.4													109,295
6.5													2,800
6.7													
Total	**35,345**												
Primary education													112,095
5.1													
5.3	113159												
5.4													250,509
6.5													730
6.7													
Total	**113159**												
Secondary education													251,239
5.1													
5.3	207800												
5.4													931,708
6.5													32,100
6.7													
Total	**207,800**												
Tertiary education													963,808
5.1													
5.2										2,000			205,480
5.3													
5.4										210,528			3,780,791
6.5													186,038
6.7										59,100			147,416
Total													777,779
Training										**271,628**			**5,091,431**
5.1	11076												11,076

Source: MEF/DNPP—Calendarios de Compromiso

Appendix 6.12: (continued)

Departments	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
5.3												
5.4												
6.5												
6.7												
Total												
Special education												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Assistance												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Physical education												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Culture												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Military College												
5.1												
5.3	660,090				1,566,000							
5.4												
6.5												
6.7												
Total	660,090				1,566,000							
Department aggregate												
5.1	252,400			13,500			91,734	1,000		108,838		1
5.2												
5.3	2,515,598	503,433	281,662	1,488,409	6,463,259	502,915	81,000	710,841	38,829	318,619	1,346,096	274,776
5.4	181,337	23,848	139,315	211,837	37,101			2,000	19,052	19,999		
6.5	88,316				385,003			108,860				
6.6					6,000							
6.7	480,581	74,920	41,985		800,789		45,000	356,487		179,663	329,729	249,636
Total	3,518,232	602,201	462,962	1,713,746	7,692,152	502,915	217,734	1,179,188	57,881	627,119	1,675,825	524,412

Source: MEF - DNPP / Calendarios de Compromiso por Subprogramas y Programas, 1997

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Appendix 6.12: (continued)

Departments	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huan-cavelica	Huánuco	Pasco	Junín	Ancash	San Martín	COR-DELICA	Total
5.3	151411												151,411
5.4	0												
6.5	2200												2,200
6.7	49450												49,450
Total	214,137												214,137
Special education													
5.1													
5.3	2721												2,721
5.4													
6.5													
6.7													
Total	2,721												2,721
Assistance													
5.1													
5.3													
5.4													
6.5													
6.7													
Total													
Physical education													
5.1													
5.3													
5.4													
6.5													
6.7													
Total													
Culture													
5.1													
5.3													
5.4													
6.5													
6.7													
Total													
Military College													
5.1			1,464,661										
5.3													1,464,661
5.4													2,226,890
6.5													
6.7			1,464,661										
Total			2,929,322										1,464,661
Department aggregate													5,155,412
5.1	11,076		1,485,661		20,358								
5.2										2,000			1,986,567
5.3	605,524	8,480	10,500	102,397	92,478	14,987	14,987	17,262	258,240	411,352	286,356	1,523,575	17,871,578
5.4										855			635,344
6.5	2,200									59,100		17,204,294	17,847,773
6.6	40,100									2,804			48,904
6.7	181,893	19,250	1,464,661	60,280	31,070	33,270	33,270	74,660	176,196	33,563	69,651	2,982,702	7,719,256
Total	840,793	27,730	2,960,822	162,677	143,906	48,257	48,257	91,922	434,436	509,674	356,007	21,710,571	46,109,419

Source: MEF - DNPP / Calendarios de Compromiso por Subprogramas y Programas, 1997

Appendix 6.13: Recurrent Public Ependiture by Level, by Function, and by Department from Other Sources, 1997

Departments	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Cajamarca	Amazonas	Lambayeque	Cusco
Pension												
5.2												
5.4												
Total												
Administration												
5.1												
5.3												
5.4												
6.5												
6.6												
6.7												
Total												
Planning												
5.1												
5.3												
5.4												
6.5			676,515									
6.7												
Total			**676,515**									
Initial education												
5.1												
5.3												
5.4												
6.5	1,100,212	1,137,809	1,358,203	825,780	307,103		265,000		369,000	144,016		
6.7		20,818		2,880	129,847				98,200			
Total	**1,100,212**	**1,158,627**	**1,358,203**	**828,660**	**436,950**		**265,000**		**467,200**	**144,016**		
Primary education												
5.1												
5.3			5,000									
5.4										2,017		
6.5	11,385,437	1,907,248	6,035,722	2,045,641	377,189	164,256	265,000	508,340	958,334	240,553		
6.7	150,000		609,433	10,880	135,653		45,000	69,850	101,568	74,457		
Total	**11,535,437**	**1,907,248**	**6,650,155**	**2,056,521**	**512,842**	**164,256**	**310,000**	**578,190**	**1,059,902**	**317,027**		
Secondary education												
5.1												
5.3												
5.4												
6.5	6,725,526	2,586,797	8,179,434	3,223,421	873,195	637,834	148,000	99,600	957,471	165,735		
6.7		73,545	533,800	106,618	149,501		55,000	112,000				
Total	**6,725,526**	**2,660,342**	**8,713,234**	**3,330,039**	**1,022,696**	**637,834**	**203,000**	**211,600**	**957,471**	**165,735**		
Tertiary education												
5.1												
5.2												
5.3												
5.4												
6.5	2,064,935	570,634	395,258	369,713		345,782			629,051	10,000		
6.7				29,391								
Total	**2,064,935**	**570,634**	**395,258**	**399,104**		**345,782**			**629,051**	**10,000**		
Training												
5.1												
5.3												
5.4												

Source: MEF - DNPP / Calendarios de Compromiso

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Appendix 6.13: (continued)

Departments	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Cordelica	Total
Pension													
5.2													
5.4													
Total													
Administration													
5.1													
5.3													
5.4													
6.5													
6.6													
6.7													
Total													
Planning													
5.1													
5.3													
5.4													
6.5													
6.7													676,515
Total													676,515
Initial education													
5.1													
5.3													
5.4													
6.5													
6.7								165,500	19,000		336,852		6,028,475
Total								165,500	19,000		336,852		251,745 6,280,220
Primary education													
5.1	7,800			103,927						8,000			119,727
5.3				280,676					8,000	5,000			300,693
5.4													
6.5	1,137,655	196,128	1,152,083	461,000	1,175,588	720,492	1,315,631	933,954	749,505	697,500	1,985,778		34,413,834
6.7	160,374		695,013	25,448	89,032					267,000			2,433,708
Total	**1,305,829**	**196,128**	**1,847,096**	**871,051**	**1,264,620**	**720,492**	**1,315,631**	**933,954**	**757,505**	**977,500**	**1,985,778**		**37,267,162**
Secondary education													
5.1													
5.3													
5.4									4,517				4,517
6.5	745,468	228,551	548,808	360,000	48,899	948,827	2,083,251	1,063,855	3,121,959	1,063,750	2,226,961		36,037,342
6.7	136,182	273,000											1,439,646
Total	**881,650**	**501,551**	**548,808**	**360,000**	**48,899**	**948,827**	**2,083,251**	**1,063,855**	**3,126,476**	**1,063,750**	**2,226,961**		**37,481,505**
Tertiary education													
5.1													
5.2													
5.3													
5.4									1,489				1,489
6.5			72,333		25,000	278,041							
6.7									1,015,260		286,917		6,262,944
Total			72,333		25,000	278,041			6,720				36,111
Training									1,023,469		286,917		6,300,544
5.1													
5.3													
5.4													

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.13: (continued)

Departments	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Cajamarca	Amazonas	Lambayeque	Cusco
6.5												
6.7												
Total												
Special education												
5.1												
5.3												
5.4												
6.5	338,000	192,770		32,334		84,442						
6.7				8,581								
Total	338,000	192,770		40,915		84,442						
Assistance												
5.1												
5.3			843,444									
5.4												
6.5			1,015,563									
6.7												
Total			1,859,007									
Physical education												
5.1												
5.3			709,000									
5.4												
6.5		194,869	1,507,900				50,000		100,000			
6.7												
Total		194,869	2,216,900				50,000		100,000			
Culture												
5.1												
5.3			236,850									
5.4												
6.5												
6.7									101,000			
Total			236,850						101,000			
Military College												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Department aggregate	**Piura**	**Tumbes**	**Loreto**	**Ucayali**	**Arequipa**	**Moquegua**	**Tacna**	**Puno**	**Cajamarca**	**Amazonas**	**Lambayeque**	**Cusco**
5.1												
5.2												
5.3			1,794,294									
5.4										2,017		
6.5	21,614,110	6,590,147	19,168,595	6,696,889	1,557,487	1,232,314	728,000	607,940	3,115,856	560,504		
6.6												
6.7	150,000	94,363	1,143,233	158,350	415,001		100,000	181,850	199,768	74,457		
Total	21,764,110	6,684,510	22,106,122	6,855,239	1,972,488	1,232,314	828,000	789,790	3,315,624	636,778		

Source: MEF - DNPP / Calendarios de Compromiso por Subprogramas y Programas, 1997

Appendix 6.13: (continued)

Departments	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Cordelica	Total
6.5													
6.7													
Total													
Special education													
5.1													
5.3													
5.4									2,351				2,351
6.5													
6.7									166,500				814,046
Total													8,581
Assistance									168,851				824,978
5.1													
5.3													
5.4													843,444
6.5													
6.7													1,013,563
Total													
Physical education													1,859,007
5.1													
5.3													
5.4													709,000
6.5													
6.7											565,000		2,417,769
Total													
Culture											565,000		3,126,769
5.1													
5.3													
5.4													236,850
6.5													
6.7													102,000
Total													
Military College													338,850
5.1													
5.3													
5.4													
6.5													
6.7													
Total													
Department aggregate													
5.1	7,800			103,927						8,000			119,727
5.2													
5.3				280,676					16,357	5,000			3,898,344
5.4													
6.5	1,883,123	424,679	1,773,224	821,000	1,249,487	1,947,360	3,398,882	2,163,309	5,072,224	1,761,250	5,401,508		87,797,686
6.6													
6.7	296,556	273,000	695,013	23,448	89,032				6,720	267,000			4,169,791
Total	2,187,479	697,679	2,468,237	1,231,051	1,338,519	1,947,360	3,398,882	2,163,309	5,095,301	2,041,250	5,401,508		94,185,980

Source: MEF - DNPP / Calendarios de Compromiso por Subprogramas y Programas, 1997

Appendix 6.14 Total Public Expenditure on Education by Level, by Function, and by Department from All Sources of Funding, 1997

Department	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
Pension												
5.2	42,882,048	6,565,297	24,905,153	8,160,529	59,775,005	5,188,448	14,429,632	35,176,782	6,336,473	35,039,038	41,799,402	43,909,463
5.4	5,147		8,698									
Total	**42,887,195**	**6,565,297**	**24,913,851**	**8,160,529**	**59,775,005**	**5,188,448**	**14,429,632**	**35,176,782**	**6,336,473**	**35,039,038**	**41,799,402**	**43,909,463**
Administration												
5.1	2,985,828	474,969	3,440,557	556,035	3,284,924	202,256	773,011	1,453,201	248,052	1,111,738	915,182	3,210,007
5.3	1,645,562	250,051	2,167,430	543,182	8,023,627	193,277	171,700	582,688	155,082	754,827	1,279,098	1,165,726
5.4	194,832	3,010	160,951	100,000	37,101			2,000	19,052	23,738		
6.5	150,000				385,003							
6.6					6,000							
6.7	197,204	33,847	221,985		800,789		23,000	61,663		179,663	264,329	449,636
Total	**5,173,426**	**761,877**	**5,990,923**	**1,199,217**	**12,537,444**	**395,533**	**967,711**	**2,099,552**	**422,186**	**2,069,966**	**2,458,609**	**4,825,369**
Planning												
5.1	52,824	50,029	664,842	703,580	967,149	475,104	526,549	2,129,030	354,947	1,965,147	802,669	716,669
5.3	56,957	28,969	106,438	429,535	633,007	48,130	110,500	413,163	102,242	171,939	152,379	355,776
5.4	2,319											
6.5			676,515									
6.7				6,250				108,860				
Total	**112,100**	**78,998**	**1,447,795**	**1,139,365**	**1,600,156**	**523,234**	**659,049**	**2,649,568**	**457,189**	**2,137,086**	**955,048**	**1,072,445**
Initial education												
5.1	12,948,142	5,407,740	14,604,023	5,465,844	7,856,490	2,827,209	3,811,622	14,904,951	2,943,593	14,530,587	6,887,647	14,301,877
5.3	1,205,035	384,690	517,780	570,920	1,613,448	89,396	121,080	419,630	404,264	2,582,375	1,381,374	98,825
5.4	24,230		19,654	2,800								
6.5	1,100,212	1,137,809	1,358,203	825,780	307,103		265,000		369,000	144,016		
6.7		20,818		2,880	129,847				98,200			
Total	**15,277,619**	**6,951,057**	**16,499,660**	**6,868,224**	**9,906,888**	**2,916,605**	**4,197,702**	**15,324,581**	**3,815,057**	**17,256,978**	**8,269,021**	**14,400,702**
Primary education												
5.1	77,415,477	15,426,863	64,586,636	27,019,956	45,858,167	9,809,792	13,693,270	81,941,018	12,034,363	99,072,220	43,685,588	73,002,833
5.3	1,742,919	189,670	932,434	543,619	1,156,687	378,467	512,398	1,057,447	560,540	3,218,440	1,406,492	366,015
5.4	105,169		79,222	750								
6.5	11,385,437	1,907,248	6,035,722	2,045,641	377,189	164,256	265,000	508,340	958,334	240,553		
6.7	150,000		609,433	10,880	135,653		45,000	69,850	101,568	74,457		
Total	**90,799,002**	**17,523,781**	**73,243,447**	**29,620,846**	**47,527,696**	**10,352,515**	**14,515,668**	**83,576,655**	**13,654,805**	**102,605,670**	**45,092,080**	**73,368,848**
Secondary education												
5.1	53,456,924	13,908,622	37,856,057	17,878,936	41,868,312	9,304,497	14,611,508	57,225,685	6,906,950	49,445,673	33,336,861	33,657,209
5.3	193,023	103,873	386,032	601,484	25,360	279,104	279,838	713,065	37,485	199,621	609,438	257,110
5.4	115,973		69,849	32,100								
6.5	6,725,526	2,586,797	8,179,434	3,223,421	873,195	637,834	148,000	99,600	957,471	165,735		
6.7		73,545	533,800	106,618	149,501		55,000	112,000				361
Total	**60,491,446**	**16,672,837**	**47,025,171**	**21,844,559**	**42,916,368**	**10,221,435**	**15,094,346**	**58,150,350**	**7,901,906**	**49,811,029**	**33,946,299**	**33,914,680**
Tertiary education												
5.1	6,306,933	1,020,504	3,725,643	2,372,913	6,213,685	1,710,710	1,758,142	7,533,529	966,291	7,969,606	4,279,832	3,562,285
5.2												
5.3	1,303,616	503,200	92,683	994,359		271,066	111,700	519,504	110	47,132	677,854	112,214
5.4	18,000	23,848	14,501	151,187								
6.5	2,153,251	570,654	395,258	569,713		345,782			629,051	10,000		
6.7	361,150	74,920		29,391				276,309			65,400	
Total	**10,142,950**	**2,193,126**	**4,228,085**	**4,117,763**	**6,213,685**	**2,327,558**	**1,869,842**	**8,329,342**	**1,595,452**	**8,026,738**	**5,023,086**	**3,674,499**
Training												
5.1					106,509	252,321						

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.14 (continued)

Department	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Cordelica	Total
Pension													
5.2	11,421,581	1,680,020	14,697,274	21,931,141	35,703,279	7,789,460	17,612,609	5,458,919	53,888,645	40,440,064	20,908,096		555,698,358
5.4										10,420			24,265
Total	**11,421,581**	**1,680,020**	**14,697,274**	**21,931,141**	**35,703,279**	**7,789,460**	**17,612,609**	**5,458,919**	**53,888,645**	**40,450,484**	**20,908,096**		**555,722,623**
Administration													
5.1	2,691,208	405,161	1,024,894	3,754,053	2,549,440	1,439,518	621,938	709,528	724,441	2,759,659	1,119,927		36,455,527
5.3	484,438	137,843	487,677	658,027	614,101	731,562	384,820	390,768	1,063,442	765,871	565,138		23,215,937
5.4	8,414		810				68,872	40,000	95,170		46,291		800,241
6.5										5,400			340,403
6.6	40,100									2,804			48,904
6.7	144,521	19,250	13	60,280	31,070	17,270	17,270	74,660	211,196	88,563	67,701		2,963,910
Total	**3,368,681**	**562,254**	**1,513,394**	**4,472,360**	**3,194,611**	**2,188,350**	**1,092,900**	**1,214,956**	**2,094,249**	**3,622,297**	**1,799,057**		**64,024,923**
Planning													
5.1	247,256	92,070	664,784	533,354	396,195	637,940	456,225	378,346	137,079	2,914,811	919,245		16,785,844
5.3	131,972	44,443	22,424	110,915	21,298	167,510	137,105	78,788	36,336	388,315	466,568		8,214,709
5.4							16,000			855			19,174
6.5													785,375
6.7						16,000	16,000				2,482		81,247
Total	**379,228**	**136,513**	**687,208**	**644,269**	**417,493**	**821,450**	**625,330**	**457,134**	**173,415**	**3,303,981**	**1,388,295**		**31,886,349**
Initial education													
5.1	6,012,739	1,770,422	5,275,336	7,561,468	7,992,759	5,401,853	5,617,261	4,459,199	9,645,356	13,171,390	8,747,287		182,144,795
5.3	277,359	68,013	576,093	468,367	511,362	453,529	991,485	879,758	1,229,753	857,655	733,580		16,435,771
5.4										9,480			56,164
6.5								165,500	19,000		336,852		6,028,475
6.7													251,745
Total	**6,290,098**	**1,838,435**	**5,851,429**	**8,029,835**	**8,504,121**	**5,855,382**	**6,608,746**	**5,504,457**	**10,894,109**	**14,038,525**	**9,817,719**		**204,916,950**
Primary education													
5.1	31,531,874	6,089,880	41,046,343	46,493,928	31,808,754	33,000,244	43,283,173	17,647,761	69,919,143	70,267,200	43,645,516		998,279,999
5.3	690,189	206,504	649,275	1,620,571	405,354	979,335	1,541,404	987,651	1,574,739	1,221,801	944,759		22,886,710
5.4										11,490			196,631
6.5	1,137,655	196,128	1,152,083	461,000	1,175,588	720,492	1,315,631	933,954	749,505	697,500	1,985,778		34,413,034
6.7	160,374		695,035	25,448	89,032					267,000			2,433,730
Total	**33,520,092**	**6,492,512**	**43,542,736**	**48,600,947**	**33,478,728**	**34,700,071**	**46,140,208**	**19,569,366**	**72,243,387**	**72,464,991**	**46,576,053**		**1,058,210,104**
Secondary education													
5.1	15,047,815	3,736,113	24,542,162	24,429,814	35,348,778	14,858,481	21,738,275	14,172,554	52,731,293	51,626,277	21,441,162		649,129,958
5.3	416,968	203,601	96,224	257,067	263,054	180,976	357,935	192,428	467,497	472,380	1,087,260		7,682,823
5.4										8,910	16,600		243,432
6.5	745,468	228,551	548,808	360,000	48,899	948,827	2,083,251	1,063,855	3,121,959	1,063,750	2,226,961		36,037,342
6.7	136,182	273,000	120										1,440,127
Total	**16,346,433**	**4,441,265**	**25,187,314**	**25,046,881**	**35,660,731**	**15,988,284**	**24,179,461**	**15,428,837**	**56,320,749**	**53,171,317**	**24,771,983**		**694,533,682**
Tertiary education													
5.1	1,520,383	584,262	3,525,764	4,707,833	4,112,810	1,731,958	2,871,234	2,768,414	7,074,497	6,752,109	3,050,278		86,119,615
5.2													5,672,110
5.3	75,445	39,230	22,719	69,216	109,532	3,116	98,424	29,845	94,557	339,770	156,618		207,536
5.4													6,410,360
6.5			72,333		25,000	278,041			1,015,260	39,100	286,917		814,030
6.7			140						6,720				99,223,651
Total	**1,595,828**	**623,492**	**3,620,956**	**4,777,049**	**4,247,342**	**2,013,115**	**2,969,658**	**2,798,259**	**8,191,034**	**7,130,979**	**3,493,813**		
Training													
5.1	11,076						29,670	24,571	19,134				443,281

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.14 (continued)

Department	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
5.3					65,740	1,456						
5.4												
6.5												
6.7												
Total					172,249	253,777						
Special education												
5.1	1,498,188	637,559	659,179	469,204	2,236,227		312,093	863,768	131,251	1,031,357	638,807	832,797
5.3	38,925	14,133	3,687	31,497	2,080		12,000	71,796	3,996	11,202	24,774	33,813
5.4	1,216		11,527									
6.5	338,000	192,770		32,334		84,442						
6.7				8,581								
Total	1,876,329	844,462	674,393	541,616	2,238,307	84,442	324,093	937,564	135,247	1,042,559	663,581	866,610
Assistance												
5.1					67,994							
5.3			843,444		62,690							
5.4												
6.5			1,015,563									
6.7												
Total			1,859,007		130,684							
Physical education												
5.1				34,653								
5.3			709,000	7,100								
5.4												
6.5		194,869	1,507,900									
6.7				30,000			50,000		100,000			
Total		194,869	2,216,900	71,753			50,000		100,000			
Culture												
5.1				16,162								
5.3			236,850	28,590								
5.4												
6.5												
6.7									102,000			
Total			236,850	44,752					102,000			
Military College												
5.1												
5.3	660,090				1,010,144						559,045	
5.4					2,927,667						912,047	
6.5												
6.7												
Total	660,090				3,937,811						1,471,092	
Department aggregate												
5.1	154,664,316	36,926,286	125,536,937	54,517,283	109,469,601	24,581,889	35,486,195	166,053,182	23,585,447	175,126,328	91,105,631	129,283,677
5.2	42,882,048	6,565,297	24,905,153	8,160,529	59,775,005	5,188,448	14,429,632	35,176,782	6,336,473	35,039,038	41,799,402	43,909,463
5.3	6,846,127	1,474,586	5,995,778	3,752,486	14,510,306	1,260,896	1,319,216	3,777,293	1,263,719	6,985,536	6,443,456	2,389,479
5.4	466,886	26,858	364,402	286,837	37,101			2,000	19,052	23,738		
6.5	21,852,426	6,390,147	19,168,595	6,696,889	1,942,490	1,232,314	728,000	716,800	3,115,856	560,304		
6.6					6,000							
6.7	708,354	203,130	1,365,218	194,600	1,215,790		145,000	538,337	199,768	254,120	329,729	449,997
Total	227,420,157	51,786,304	177,336,083	73,608,624	186,956,293	32,263,547	52,108,043	206,264,394	34,538,313	217,989,064	139,678,218	176,032,616

Source: MEF - DNPP / Calendarios de Compromiso

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Appendix 6.14 (continued)

Department	Aporímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Cordelica	Total
5.3	151,411						71,554	10,101	54,000				354,262
5.4													
6.5	2,200												2,200
6.7	49,450												49,450
Total	214,137						101,234	34,672	73,134				849,193
Special education													
5.1	260,868	81,479	269,902	531,526	811,643	246,196	325,494	386,749	905,718	1,140,573	525,239		14,797,817
5.3	35,783	7,261	14,170	12,914	38,063	2,502	21,907	8,672	30,123	25,314	141,539		586,151
5.4													12,743
6.5													814,046
6.7			7						166,500				8,588
Total	296,651	88,740	284,079	544,440	849,706	248,698	347,401	395,421	1,102,341	1,165,887	666,778		16,219,345
Assistance													
5.1													
5.3													67,994
5.4													906,134
6.5													
6.7													1,015,563
Total													
Physical education													1,989,691
5.1							17,207	94,086	35,879				
5.3							50,298	15,415	21,200				181,825
5.4													803,013
6.5													
6.7											565,000		2,417,769
Total													30,000
Culture							67,505	109,501	57,079		565,000		3,432,607
5.1													
5.3													16,162
5.4													265,440
6.5													
6.7													102,000
Total													
Military College													383,602
5.1			1,955,146										
5.3			1,198,129										3,524,335
5.4			50										5,697,933
6.5													50
6.7			1,488,661										
Total			4,641,986										1,488,661
Department aggregate													10,710,979
5.1	57,323,219	12,759,387	78,304,331	88,011,976	83,020,379	57,316,190	74,960,477	40,641,208	141,192,540	148,632,019	79,448,654		1,987,947,152
5.2	11,421,581	1,680,020	14,697,274	21,931,141	35,703,279	7,789,460	17,612,609	5,458,919	53,888,645	40,440,064	20,908,096		555,698,358
5.3	2,263,565	706,895	3,066,711	3,197,077	1,962,764	2,518,530	3,654,932	2,593,426	4,571,647	4,071,106	4,095,462	1,523,575	90,244,568
5.4	8,414		860				84,872	40,000	95,170	41,155	62,891		1,560,236
6.5	1,885,323	424,679	1,773,224	821,000	1,249,487	1,947,360	3,398,882	2,163,309	5,072,234	1,825,750	5,401,508	17,204,294	105,770,861
6.6	40,100									2,804			48,904
6.7	490,527	292,250	2,183,976	85,728	120,102	33,270	33,270	74,660	217,916	355,563	70,183	2,982,702	12,544,190
Total	73,432,729	15,863,231	100,026,376	114,046,922	122,056,011	69,604,810	99,745,042	50,971,522	205,038,142	195,368,461	109,986,794	21,710,571	2,753,814,249

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.15 Departmental Revenues from Central Government Allocation as a Percentage of Total, 1997

Department	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
Pension												
5.2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.4	100%		100%									
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Administration												
5.1	98%	100%	100%	98%	100%	100%	95%	100%	100%	90%	100%	100%
5.3	50%	81%	87%	89%	39%	31%	74%	88%	86%	61%	50%	76%
5.4	9%	100%	13%	75%						16%		
6.5	100%											
6.6												
6.7	39%	100%	81%									
Total	**78%**	**94%**	**92%**	**92%**	**81%**	**66%**	**89%**	**94%**	**90%**	**71%**	**63%**	**44%**
Planning												**89%**
5.1	100%	100%	100%	100%	100%	100%	91%	100%	100%	100%	100%	100%
5.3	79%	100%	100%	100%	100%	100%	67%	88%	84%	84%	50%	100%
5.4	100%											
6.5												
6.7				100%								
Total	**89%**	**100%**	**53%**	**100%**	**100%**	**100%**	**84%**	**93%**	**96%**	**99%**	**92%**	**100%**
Initial education												
5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	100%	100%	100%	90%	100%	100%	100%	96%	100%	100%	100%	100%
5.4	100%		100%									
6.5												
6.7												
Total	**93%**	**83%**	**92%**	**87%**	**96%**	**100%**	**94%**	**100%**	**88%**	**99%**	**100%**	**100%**
Primary education												
5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	100%	100%	99%	89%	100%	100%	100%	93%	100%	100%	100%	100%
5.4	100%		100%									
6.5												
6.7												
Total	**87%**	**89%**	**91%**	**93%**	**99%**	**98%**	**98%**	**99%**	**92%**	**100%**	**100%**	**100%**
Secondary education												
5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	100%	100%	100%	27%	100%	50%	100%	80%	100%	100%	100%	100%
5.4	100%		100%									
6.5												
6.7												
Total	**89%**	**84%**	**81%**	**83%**	**98%**	**92%**	**99%**	**99%**	**88%**	**100%**	**100%**	**100%**
Tertiary education												**100%**
5.1	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.2												
5.3	21%	9%	100%	12%		15%	100%	33%	100%	100%	6%	100%
5.4	72%		100%									
6.5												
6.7												
Total	**63%**	**49%**	**91%**	**61%**	**100%**	**75%**	**100%**	**92%**	**61%**	**100%**	**86%**	**100%**
Training												
5.1					100%	100%						

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.15 (continued)

Department	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Total
Pension												
5.2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.4										100%		100%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Administration												
5.1	100%	100%	98%	100%	99%	100%	100%	100%	100%	100%	100%	99%
5.3	80%	94%	98%	86%	85%	99%	98%	96%	76%	75%	71%	63%
5.4	100%		100%				100%	100%	100%		100%	48%
6.5										100%		29%
6.6												
6.7	8%		100%						17%	62%		20%
Total	**92%**	**98%**	**98%**	**97%**	**98%**	**99%**	**98%**	**93%**	**79%**	**94%**	**87%**	**81%**
Planning												
5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	100%	100%	100%	92%	100%	96%	96%	100%	100%	98%	73%	91%
5.4							100%					96%
6.5												
6.7											21%	8%
Total	**100%**	**100%**	**100%**	**99%**	**100%**	**97%**	**96%**	**100%**	**100%**	**100%**	**91%**	**94%**
Initial education												
5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	87%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99%
5.4										100%		95%
6.5												
6.7												
Total	**99%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**97%**	**100%**	**100%**	**97%**	**97%**
Primary education												
5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	84%	100%	100%	83%	100%	100%	100%	100%	99%	100%	100%	98%
5.4										100%		100%
6.5												
6.7			0%									0%
Total	**96%**	**97%**	**96%**	**98%**	**96%**	**98%**	**97%**	**93%**	**99%**	**99%**	**96%**	**96%**
Secondary education												
5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	50%	100%	100%	100%	100%	100%	100%	100%	99%	100%	100%	88%
5.4										100%	100%	87%
6.5												
6.7			100%									0%
Total	**93%**	**89%**	**98%**	**99%**	**100%**	**94%**	**91%**	**93%**	**94%**	**98%**	**91%**	**94%**
Tertiary education												
5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.2												
5.3	100%	100%	100%	100%	100%	100%	100%	100%	98%	38%	100%	33%
5.4												13%
6.5												
6.7			100%									0%
Total	**100%**	**100%**	**98%**	**100%**	**99%**	**86%**	**100%**	**100%**	**88%**	**96%**	**92%**	**89%**
Training												
5.1							100%	100%	100%			98%

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.15 (continued)

Department	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
5.3					100%	100%						
5.4												
6.5												
6.7												
Total					100%	100%						
Special education												
5.1	100%	100%	100%	100%	100%		100%	100%	100%	100%	100%	100%
5.3	100%	100%	100%	100%	100%		100%	100%	100%	100%	100%	100%
5.4	100%		100%									
6.5												
6.7												
Total	82%	77%	100%	92%	100%		100%	100%	100%	100%	100%	100%
Assistance												
5.1					100%							
5.3					100%							
5.4												
6.5												
6.7												
Total					100%							
Physical education												
5.1				100%								
5.3				100%								
5.4												
6.5												
6.7				100%								
Total				100%								
Culture												
5.1				100%								
5.3				100%								
5.4												
6.5												
6.7												
Total				100%								
Military College												
5.1					100%							
5.3					47%						100%	
5.4											100%	
6.5												
6.7												
Total					60%						100%	
Department aggregate	**Piura**	**Tumbes**	**Loreto**	**Ucayali**	**Arequipa**	**Moquegua**	**Tacna**	**Puno**	**Amazonas**	**Cajamarca**	**Lambayeque**	**Cusco**
5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	83%	66%	65%	60%	55%	60%	94%	81%	97%	95%	79%	89%
5.4	61%	11%	62%	26%								
6.5	1%											
6.6												
6.7	11%	17%	13%	19%								
Total	**89%**	**86%**	**87%**	**88%**	**95%**	**95%**	**98%**	**99%**	**90%**	**99%**	**99%**	**45%**
												100%

Source: MEF - DNPP / Calendarios de Compromiso

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Appendix 6.15 (continued)

Department	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Total
5.3												
5.4							100%	100%	100%			57%
6.5												
6.7												
Total							100%	100%	100%			75%
Special education												
5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	92%	100%	100%	100%	100%	100%	100%	100%	92%	100%	100%	99%
5.4												100%
6.5												
6.7			100%									0%
Total	99%	100%	100%	100%	100%	100%	100%	100%	85%	100%	100%	95%
Assistance												
5.1												100%
5.3												7%
5.4												
6.5												
6.7												
Total												7%
Physical education												
5.1												
5.3							100%	100%	100%			100%
5.4							100%	100%	100%			12%
6.5												
6.7												
Total												100%
Culture							100%	100%	100%			9%
5.1												
5.3												100%
5.4												11%
6.5												
6.7												
Total												12%
Military College												
5.1			25%									
5.3			100%									58%
5.4			100%									61%
6.5												100%
6.7			2%									
Total			37%									2%
Department aggregate												83%
5.1	100%	100%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
5.3	73%	99%	100%	88%	95%	99%	100%	99%	94%	90%	93%	78%
5.4							100%	100%	100%	98%	100%	59%
6.5										0%		0%
6.6												
6.7	2%		1%						16%	15%	1%	5%
Total	96%	95%	95%	99%	99%	97%	97%	96%	97%	99%	95%	95%

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.16 Department's Own Resrouces as a Percentage of Total, 1997

Department	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
Pension												
5.2												
5.4												
Total												
Administration												
5.1	2%			2%			5%			10%		
5.3	50%	19%	13%	11%	61%	69%	26%	12%	14%	39%	50%	24%
5.4	91%		87%	25%	100%			100%	100%	84%		
6.5					100%							
6.6					100%							
6.7	61%		19%		100%		100%	100%		100%	100%	56%
Total	22%	6%	8%	8%	69%	34%	11%	6%	10%	29%	37%	11%
Planning												
5.1							9%	0%				
5.3	21%						33%	12%	16%	16%	50%	
5.4								100%				
6.5							100%	100%				
6.7							16%	7%	4%	1%	8%	
Total	11%											
Initial education												
5.1												
5.3				10%				4%				
5.4				100%								
6.5												
6.7				1%				0%				
Total												
Primary education												
5.1												
5.3				11%				7%				
5.4				100%								
6.5												
6.7				0%				0%				
Total												
Secondary education												
5.1												
5.3				73%		50%		20%				
5.4				100%								
6.5												
6.7				2%		1%		0%				
Total												
Tertiary education												
5.1	3%											
5.2												
5.3	79%	91%		88%		85%		67%			94%	
5.4	28%	100%		100%								
6.5	4%											
6.7	100%	100%						100%			100%	
Total	17%	25%		25%		10%		8%			14%	
Training												
5.1												

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.16 (continued)

Department	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Total
Pension												
5.2												
5.4												
Total												
Administration												
5.1			2%		1%							1%
5.3	20%	6%	2%	14%	15%	1%	2%	4%	24%	25%	29%	37%
5.4											0%	52%
6.5												71%
6.6	100%									100%		100%
6.7	92%	100%		100%	100%	100%	100%	100%	83%	38%	100%	80%
Total	8%	5%	2%	3%	5%	1%	2%	8%	21%	6%	13%	19%
Planning												
5.1												0%
5.3				8%		4%	4%			2%	27%	9%
5.4										100%		4%
6.5												14%
6.7						100%	100%				79%	92%
Total				1%		3%	4%			0%	9%	3%
Initial education												
5.1												
5.3	13%											1%
5.4												5%
6.5												
6.7												
Total	1%											0%
Primary education												
5.1												
5.3	16%											1%
5.4												0%
6.5												
6.7												
Total	0%											0%
Secondary education												
5.1												
5.3	50%											12%
5.4												13%
6.5												
6.7												
Total	1%											0%
Tertiary education												
5.1												
5.2										0%		0%
5.3												
5.4										62%		67%
6.5												87%
6.7										100%		2%
Total												96%
Training										4%		3%
5.1	100%											2%

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.16 (continued)

Department	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
5.3												
5.4												
6.5												
6.7												
Total												
Special education												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Assistance												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Physical education												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Culture												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Military College												
5.1												
5.3	100%				53%							
5.4												
6.5												
6.7												
Total	100%				40%							
Department aggregate												
5.1												
5.2												
5.3	37%	34%	5%	40%	45%	40%	6%	19%	3%	5%	21%	11%
5.4	39%	89%	38%	74%	100%			100%	100%	84%		
6.5	0%				20%			15%				
6.6					100%							
6.7	68%	37%	3%		66%		31%	66%		71%	100%	35%
Total	3%	1%	0%	2%	4%	2%	0%	1%	0%	0%	1%	0%

Source: MEF - DNPP / Calendarios de Compromiso

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Appendix 6.16 (continued)

Department	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Total
5.3	100%											43%
5.4												
6.5	100%											100%
6.7	100%											100%
Total	100%											25%
Special education												
5.1												0%
5.3	8%											
5.4												
6.5												
6.7												
Total	1%											
Assistance												0%
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Physical education												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Culture												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Military College												
5.1			75%									42%
5.3												39%
5.4												
6.5												
6.7			98%									98%
Total			63%									48%
Department aggregate												
5.1			2%		0%					0%		0%
5.3	27%	1%	0%	3%	5%	1%	0.41%	1%	6%	10%	7%	20%
5.4	0%									2%		41%
6.5	100%									3%		17%
6.6	37%	7%	67%	70%	26%	100%	100%	100%	81%	9%	99%	62%
6.7	1%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	2%
Total												

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.17 Other Resources as a Percentage of Total, 1997

Department	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
Pension												
5.2												
5.4												
Total												
Administration												
5.1												
5.3												
5.4												
6.5												
6.6												
6.7												
Total												
Planning												
5.1												
5.3												
5.4												
6.5			100%									
6.7												
Total			47%									
Initial education												
5.1												
5.3												
5.4												
6.5	100%	100%	100%	100%	100%		100%		100%	100%		
6.7		100%		100%	100%				100%			
Total	7%	17%	8%	12%	4%		6%		12%	1%		
Primary education												
5.1												
5.3			1%									
5.4										0%		
6.5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
6.7	100%		100%	100%	100%		100%	100%	100%	100%		
Total	13%	11%	9%	7%	1%	2%	2%	1%	8%	0%		
Secondary education												
5.1												
5.3												
5.4												
6.5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
6.7		100%	100%	100%	100%		100%	100%				
Total	11%	16%	19%	19%	2%	6%	1%	0%	13%	0%		
Tertiary education												
5.1												
5.2												
5.3												
5.4												
6.5	96%	100%	100%	100%		100%			100%	100%		
6.7				100%								
Total	20%	26%	9%	19%		19%			39%	0%		
Training												
5.1												
Total	1%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	2%

Source: MEF - DNPP / Calendarios de Compromiso

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Appendix 6.17 (continued)

Department	Apurimac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martin	Total
Pension												
5.2												
5.4												
Total												
Administration												
5.1												
5.3												
5.4												
6.5												
6.6												
6.7												
Total												
Planning												
5.1												
5.3												
5.4												
6.5												
6.7												86%
Total												
Initial education												3%
5.1												
5.3												
5.4												
6.5												
6.7								100%	100%		100%	100%
Total												100%
Primary education								3%	0%		3%	3%
5.1	0%			0%						0%		0%
5.3				17%					1%	0%		1%
5.4												
6.5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
6.7	100%		100%	100%	100%					100%		100%
Total	4%	3%	4%	2%	4%	2%	3%	5%	1%	1%	4%	4%
Secondary education												
5.1												
5.3												
5.4									1%			0%
6.5	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
6.7	100%	100%										100%
Total	5%	11%	2%	1%	0%	6%	9%	7%	6%	2%	9%	5%
Tertiary education												
5.1												
5.2												
5.3												
5.4									2%			0%
6.5			100%		100%	100%			100%		100%	98%
6.7									100%			4%
Total			2%		1%	14%			12%		5%	6%
Training												
5.1												

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6.17 (continued)

Department	Piura	Tumbes	Loreto	Ucayali	Arequipa	Moquegua	Tacna	Puno	Amazonas	Cajamarca	Lambayeque	Cusco
5.3												
5.4												
6.5												
6.7												
Total												
Special education												
5.1												
5.3												
5.4												
6.5	100%	100%		100%		100%						
6.7				100%								
Total	18%	23%		8%		100%						
Assistance												
5.1												
5.3			100%									
5.4												
6.5			100%									
6.7												
Total			100%									
Physical education												
5.1												
5.3			100%									
5.4												
6.5		100%	100%				100%		100%			
6.7												
Total		100%	100%				100%		100%			
Culture												
5.1												
5.3			100%									
5.4												
6.5												
6.7									100%			
Total			100%						100%			
Military College												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Department aggregate												
5.1												
5.2												
5.3			30%									
5.4										0.029%		
6.5	99%	100%	100%	100%	80%	100%	100%	85%	100%	100%		
6.6												
6.7	21%	46%	84%	81%	34%		69%	34%	100%	29%		
Total	10%	13%	12%	9%	1%	4%	2%	0%	10%	0%		

Source: MEF - DNPP / Calendarios de Compromiso

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Appendix 6.17 (continued)

Department	Apurímac	Madre de Dios	La Libertad	Ayacucho	Ica	Huancavelica	Huánuco	Pasco	Junín	Ancash	San Martín	Total
5.3												
5.4												
6.5												
6.7												
Total												
Special education												
5.1												
5.3												
5.4									8%			0%
6.5												
6.7									100%			100%
Total												100%
Assistance									15%			5%
5.1												
5.3												
5.4												93%
6.5												
6.7												100%
Total												93%
Physical education												
5.1												
5.3												
5.4												88%
6.5												
6.7											100%	100%
Total											100%	91%
Culture												
5.1												
5.3												
5.4												89%
6.5												
6.7												100%
Total												88%
Military College												
5.1												
5.3												
5.4												
6.5												
6.7												
Total												
Department aggregate												
5.1	0%			0%						0%		0%
5.2												
5.3				9%					0%	0%		2%
5.4												
6.5	100%	100%	100%	100%	100%	100%	100%	100%	100%	96%	100%	83%
6.6												
6.7	60%	93%	32%	30%	74%				3%	75%		33%
Total	3%	4%	2%	1%	1%	3%	3%	4%	2%	1%	5%	3%

Source: MEF - DNPP / Calendarios de Compromiso

Appendix 6: 18: Per Student Recurrent Expenditure by Level and by Department, 1997 (Soles)						
	Initial	Primary	Secondary	Tertiary nonuniversity	Vocational training	Special
Amazonas	177	168	320	283	7	1,225
Ancash	328	411	661	733	21	1,016
Apurímac	295	352	558	655	181	2,083
Arequipa	363	459	683	620	135	2,832
Ayacucho	337	406	675	867	25	1,397
Cajamarca	278	362	609	711	9	1,718
Cusco	289	352	437	590	15	1,363
Huancavelica	130	175	206	694	19	406
Huánuco	322	313	525	671	39	1,616
Ica	318	398	596	550	19	1,725
Junín	292	357	527	654	20	1,439
La Libertad	300	315	530	750	8	2,171
Lambayeque	270	326	438	722	12	1,197
Lima - Callao	444	454	529	815	413	1,536
Loreto	376	386	675	836	22	2,078
Madre de Dios	498	401	575	739	24	1,996
Moquegua	490	640	850	1,094	169	24
Pasco	403	394	650	1,167	35	1,510
Piura	255	327	545	1,107	12	1,668
Puno	233	416	580	689	12	2,271
San Martín	371	379	513	820	16	2,253
Tacna	372	486	688	786	23	2,516
Tumbes	476	599	896	782	13	2,025
Ucayali	292	350	610	1,327	17	1,355
PERÚ	335	385	557	750	180	1,615

Appendix 6.19: Teachers Salary Scale (July 1990-August 1997) (Soles in current prices)

LEVEL AND WORK SHIFT	1990		1991			1992		1993	1994		NOVEMBER - 1996			AUGUST - 1997		
	JUL	AUG	FEB	AUG	SEP	JAN	AUG	MAY	APR	OCT	20530	19990	AFP	20530	19990	AFP
With title																
V 40 Hrs.	17.58	35.16	73.78	121.06	138.31	163.21	223.21	293.21	413.21	557.21	642.88	662.49	703.65	745.74	768.49	816.23
30 Hrs.	16.49	32.97	65.87	106.22	123.47	149.86	209.86	279.86	394.86	536.86	619.28	638.04	677.45	718.36	740.13	785.84
24 Hrs.	13.65	27.30	60.20	97.60	114.85	129.31	189.31	259.31	369.31	502.31	579.20	597.11	634.72	671.87	692.65	736.28
IV 40 Hrs.	16.66	33.31	69.68	111.66	128.91	153.42	213.42	283.42	399.42	539.42	622.25	641.18	680.95	721.81	743.77	789.9
30 Hrs.	15.50	31.00	63.59	100.04	117.29	142.02	202.02	272.02	384.02	521.02	600.90	619.13	657.39	697.04	718.19	762.57
24 Hrs.	13.13	26.26	59.63	94.13	111.38	124.22	184.22	254.22	362.22	492.22	567.50	585.09	622.04	658.3	678.19	721.57
III 40 Hrs.	15.87	31.74	67.39	104.90	122.15	146.33	206.33	276.33	389.33	525.33	605.90	624.31	662.97	702.84	724.2	769.05
30 Hrs.	15.01	30.01	61.25	93.00	110.25	135.32	195.32	265.32	374.32	508.32	586.17	603.89	641.11	679.96	700.51	743.69
24 Hrs.	12.70	25.40	57.99	88.29	105.54	119.23	179.23	249.23	354.23	481.23	554.75	571.87	607.83	643.51	663.37	705.08
II 40 Hrs.	15.59	31.17	65.25	99.64	116.89	139.99	199.99	269.99	379.99	512.99	591.59	609.57	647.32	686.24	707.1	750.89
30 Hrs.	14.50	29.00	59.85	88.70	105.95	129.98	189.98	259.98	365.98	499.98	576.50	593.94	630.57	668.74	688.97	731.46
24 Hrs.	12.27	24.54	56.71	84.11	101.36	114.97	174.97	244.97	347.97	471.97	544.01	560.78	595.99	631.05	650.5	691.35
I 40 Hrs.	14.33	28.65	62.05	93.31	110.56	133.57	193.57	263.57	371.57	501.57	578.34	595.89	632.73	670.87	691.23	733.97
30 Hrs.	13.52	27.03	57.89	83.84	101.09	125.04	185.04	255.04	360.04	488.04	562.65	579.64	615.32	652.67	672.38	713.77
24 Hrs.	11.60	23.20	55.06	79.56	96.81	111.11	171.11	241.11	343.11	465.11	536.05	552.53	587.14	621.82	640.93	681.08
Without title																
A 40 Hrs.	13.54	27.07	56.48	78.98	96.23	116.98	176.98	236.98	326.98	442.98	510.38	525.76	558.08	592.04	609.88	647.37
30 Hrs.	12.60	25.21	52.59	74.84	92.09	111.24	171.24	231.24	321.29	436.24	502.56	517.75	549.65	582.97	600.59	637.59
24 Hrs.	11.00	22.00	50.18	72.18	89.43	99.29	159.29	219.29	309.29	420.29	484.06	498.99	530.36	561.51	578.83	615.22
B 40 Hrs.	13.45	26.90	56.25	78.25	95.50	111.90	171.90	231.90	321.90	435.90	502.16	517.45	549.54	582.51	600.24	637.47
30 Hrs.	12.55	25.09	52.37	74.12	91.37	106.36	166.36	226.36	316.36	429.36	494.58	509.66	541.35	573.71	591.21	627.97
24 Hrs.	10.95	21.90	49.99	71.49	88.74	95.41	155.41	215.41	305.41	415.41	478.40	493.27	524.50	554.94	572.19	608.42
C 40 Hrs.	13.41	26.83	56.01	77.51	94.76	106.81	166.81	226.81	316.81	429.81	495.10	510.32	542.27	574.32	591.97	629.03
30 Hrs.	12.49	24.97	52.17	73.42	90.67	101.51	161.51	221.51	311.51	423.51	487.79	502.81	534.36	565.84	583.26	619.86
24 Hrs.	10.90	21.80	49.79	70.79	88.04	91.51	151.51	211.51	301.51	409.51	471.55	486.32	517.33	547	564.13	600.1
D 40 Hrs.	13.35	26.70	55.78	76.78	94.03	101.73	161.73	221.73	311.73	422.73	486.89	502.00	533.73	564.79	582.32	619.13
30 Hrs.	12.43	24.86	51.95	72.70	89.95	96.63	156.63	216.63	306.63	416.63	479.81	494.73	526.06	556.58	573.89	610.23
24 Hrs.	10.85	21.70	49.61	70.11	87.36	87.63	147.63	207.63	297.63	404.63	465.89	480.59	511.47	540.43	557.48	593.31
E 40 Hrs.	13.29	26.57	55.11	75.61	92.86	96.21	156.21	216.21	306.21	415.21	478.16	493.15	524.64	554.67	572.05	608.58
30 Hrs.	12.38	24.76	50.12	70.37	87.62	90.14	150.14	210.14	300.14	408.14	469.96	484.71	515.69	545.15	562.26	598.2
24 Hrs.	10.80	21.60	49.40	69.40	88.65	86.65	146.65	206.65	296.65	402.65	463.59	478.23	508.97	537.76	554.75	590.41
TOTAL AVERAGE /*	**13.21**	**26.43**	**56.81**	**83.62**	**100.88**	**117.50**	**177.50**	**244.32**	**345.36**	**469.08**	**540.65**	**557.20**	**591.94**	**627.16**	**646.34**	**686.65**

*/ The weighted average used the number of teachers and the structure by magisterial level of 1997, Lima

Source: Payroll USE 04-EL AGUSTINO (Personnel Office MED)

APPENDIX 7

HOUSEHOLD EXPENDITURE ON EDUCATION

Appendix 7.1: Average Household Expenditures on Preprimary Education by School Type, 1997 (Soles per Child)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Sample size	Projected population
Q1-poorest	Private		10.34		10.27	20.62	1	807
	Public	3.82	23.58	20.73	14.22	62.35	226	260,964
Q2	Parochial	2.07	46.52	41.35	45.20	135.14	2	2,758
	Private	61.17	138.60	78.56	163.20	441.54	5	6,634
	Public	6.24	38.38	33.13	30.37	108.13	202	225,617
Q3	Parochial	18.25	42.13	126.26	204.07	390.71	2	2,193
	Private	95.01	123.05	81.38	305.68	605.12	9	12,893
	Public	12.62	62.50	46.56	57.50	179.18	145	170,802
Q4	Parochial	36.24	77.65	51.77	360.66	526.32	1	586
	Private	59.11	140.71	122.01	440.61	762.44	23	33,850
	Public	23.11	66.92	67.41	94.55	251.99	125	154,129
Q5-richest	Parochial	46.62	207.20	207.20	401.97	863.00	1	1,648
	Private	167.97	208.61	141.54	1,073.94	1,592.07	31	42,159
	Public	39.21	102.01	81.03	208.66	430.91	64	78,465
All	Parochial	20.01	84.58	106.16	201.23	411.98	6	7,185
	Private	111.20	166.82	121.11	676.99	1,076.12	69	96,343
	Public	12.58	49.22	42.23	57.68	161.71	762	889,977
Sum total	**All types**	**22.20**	**60.88**	**50.34**	**118.77**	**252.20**	**837**	**993,505**

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.2: Average Household Expenditures on Primary Education by School Type, 1997 (Soles per Student)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Sample size	Projected population
Q1-poorest	Private	20.73	83.13		226.09	330	1	1,648
	Public	8.23	30.7	28.31	21.21	88.45	765	895,101
Q2	Parochial	12.08	78.01	51.44	89.95	231.47	7	10,192
	Private	40.78	85.7	128.54	195.58	450.6	5	7,967
	Public	11.03	45.9	41.36	44.11	142.4	700	827,612
Q3	Parochial	45.3	74.6	82.47	160.2	362.57	7	9,795
	Private	81.06	131.59	86.75	516.47	815.88	18	25,835
	Public	13.67	66.32	57.44	70.79	208.22	581	685,956
Q4	Parochial	182.3	91.45	88.75	378.14	740.64	7	8,099
	Private	78.1	157.83	103.4	516.62	855.95	50	70,539
	Public	20.02	85.04	78.72	123.92	307.7	409	494,873
Q5-richest	Parochial	88.66	96.19	141.37	410.32	736.55	5	7,832
	Private	346.04	209.34	137.69	1543.7	2236.76	111	150,271
	Public	31.3	118.41	102.85	210.14	462.7	227	270,195
All	Parochial	76.22	84.08	87.92	243.95	492.17	26	35,917
	Private	233.99	182.67	121.94	1107.03	1645.63	185	256,259
	Public	13.94	58.3	52.22	70	194.45	2682	3,173,737
Sum total	**All types**	**30.85**	**67.76**	**57.74**	**148.48**	**304.84**	**2893**	**3,465,914**

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.3: Average Household Expenditures on Secondary Education by School Type, 1997 (Soles per Student)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Sample size	Projected population
Q1-poorest	Private	23.90	57.55	15.17	285.58	382.20	3	3,572
	Public	15.69	44.35	44.02	43.09	147.16	237	288,154
Q2	Private	83.72	110.79	49.17	100.40	344.09	4	5,811
	Public	22.97	59.31	57.79	74.10	214.15	323	409,393
Q3	Parochial	88.26	102.52	40.72	74.86	306.37	6	9,131
	Private	74.58	78.49	37.85	226.90	417.82	8	11,051
	Public	34.15	79.52	57.20	141.94	312.81	323	402,306
Q4	Parochial	99.91	102.58	69.61	521.46	793.56	3	4,932
	Private	87.05	110.77	96.49	375.88	670.19	33	48,807
	Public	43.88	103.24	72.24	224.54	443.90	341	437,669
Q5-richest	Parochial	57.61	95.71	136.78	905.40	1,195.50	7	8,387
	Private	364.82	246.91	121.21	1,570.44	2,303.38	82	111,946
	Public	102.79	138.91	77.93	454.88	774.51	239	318,495
All	Parochial	79.37	99.99	82.95	483.24	745.55	16	22,450
	Private	256.56	191.86	105.07	1,094.23	1,647.72	130	181,188
	Public	42.89	85.38	62.39	184.81	375.47	1,463	1,856,017
Sum total	**All types**	**62.08**	**94.91**	**66.37**	**268.06**	**491.42**	**1,609**	**2,059,656**

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.4: Average Household Expenditures on Tertiary Nonuniversity Education by School Type, 1997 (Soles per Student)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Sample size	Projected population
Q1-poorest	Public	41.13	46.27	36.69	121.12	245.21	18	21,213
Q2	Public	91.53	100.12	28.73	291.62	512.00	32	39,808
Q3	Private	100.44	401.78	16.07	1,622.45	2,140.75	1	1,379
	Public	93.11	71.15	22.76	405.79	592.82	33	43,187
Q4	Private	146.04	143.51	53.41	1,172.44	1,515.41	4	6,329
	Public	114.11	106.99	49.66	436.39	707.16	56	68,602
Q5-richest	Parochial	47.78	73.77	12.29	1,773.78	1,907.63	2	2,899
	Private	130.62	110.87	16.31	1,209.02	1,466.82	13	16,145
	Public	174.50	163.57	51.97	933.35	1,323.58	55	69,103
All	Parochial	47.78	73.77	12.29	1,773.78	1,907.63	2	2,899
	Private	132.97	136.35	26.14	1,223.22	1,518.68	18	23,853
	Public	117.50	110.30	40.94	521.47	790.21	194	241,914
Sum total	**All types**	**118.12**	**112.22**	**39.32**	**597.29**	**866.94**	**214**	**268,667**

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.5: Average Household Expenditures on University Education by School Type, 1997 (Soles per Student)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Sample size	Projected population
Q1-poorest	Public	73.99	69.79	13.64	197.03	354.45	11	16,159
Q2	Private	150.26	61.79			212.05	1	1,398
	Public	96.08	91.50		168.80	356.39	20	23,786
Q3	Private	481.61	80.13	0.00	1,352.21	1,913.95	1	1,648
	Public	124.90	142.42	9.91	361.53	638.76	59	73,714
Q4	Private	171.44	80.06	0.00	619.56	871.05	6	8,599
	Public	132.99	166.65	5.16	433.58	738.39	72	101,796
Q5-richest	Parochial	205.10	204.14	0.00	1,257.67	1,666.91	4	5,791
	Private	403.13	305.94	7.90	2,829.92	3,546.89	96	126,701
	Public	197.99	239.78	14.05	1,151.31	1,603.13	135	186,601
	Parochial	266.36	176.66	0.00	1,278.62	1,721.64	5	7,439
All	Private	385.97	289.23	7.32	2,661.94	3,344.47	103	136,698
	Public	157.12	187.81	10.20	728.31	1,083.43	297	402,055
Sum total	**All types**	**215.88**	**213.04**	**9.34**	**1,219.74**	**1,658.01**	**405**	**546,192**

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.6: Average Household Expenditures on Education by Education Level, 1997 (Soles per Student)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Sample size	Projected population
Q1-poorest	Preprimary	3.81	23.54	20.66	14.21	62.22	227	261,772
	Primary	8.26	30.80	28.26	21.58	88.90	766	896,749
	Secundary	15.79	44.51	43.67	46.06	150.04	240	291,726
	Sup. no univ.	41.13	46.27	36.69	121.12	245.21	18	21,213
	Sup. univ.	73.99	69.79	13.64	197.03	354.45	11	16,159
Q2	Preprimary	7.74	41.31	34.51	34.30	117.86	209	235,010
	Primary	11.32	46.66	42.30	46.09	146.37	712	845,770
	Secundary	23.82	60.03	57.66	74.46	215.97	327	415,204
	Sup. no univ.	91.53	100.12	28.73	291.62	512.00	32	39,808
	Sup. univ.	99.09	89.85	0.00	159.43	348.37	21	25,184
Q3	Preprimary	18.40	66.46	49.91	76.44	211.22	156	185,887
	Primary	16.51	68.77	58.83	87.96	232.07	606	721,586
	Secondary	36.37	79.99	56.34	142.71	315.42	337	422,488
	Sup. no univ.	93.33	81.39	22.56	443.44	640.72	34	44,566
	Sup. univ.	132.70	141.05	9.70	383.20	666.65	60	75,362
Q4	Preprimary	29.61	80.20	77.17	157.50	344.48	149	188,565
	Primary	29.46	94.08	81.90	175.81	381.25	466	573,511
	Secondary	48.73	103.98	74.62	242.56	469.88	377	491,409
	Sup. no univ.	116.81	110.07	49.98	498.56	775.42	60	74,931
	Sup. univ.	135.99	159.91	4.76	448.06	748.72	78	110,394
Q5-richest	Preprimary	83.71	140.19	103.59	509.62	837.10	96	122,272
	Primary	142.78	149.91	115.78	681.69	1,090.15	343	428,297
	Secondary	168.77	165.63	90.10	748.07	1,172.57	328	438,828
	Sup. no univ.	162.29	150.96	44.14	1,011.64	1,369.03	70	88,148
	Sup. univ.	279.57	265.40	11.36	1,819.76	2,376.09	235	319,093
All groups	Preprimary	22.20	60.88	50.34	118.77	252.20	837	993,505
	Primary	30.85	67.76	57.74	148.48	304.84	2,893	3,465,914
	Secondary	62.08	94.91	66.37	268.06	491.42	1,609	2,059,656
	Sup. no univ.	118.12	112.22	39.32	597.29	866.94	214	268,667
	Sup. univ.	215.88	213.04	9.34	1,219.74	1,658.01	405	546,192
Sum total	**All types**	**55.43**	**86.90**	**54.88**	**274.26**	**471.47**	**5,958**	**7,333,934**

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.7: Average Household Expenditures on Education by School Type, 1997 (Soles per Student)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Sample size	Projected population
Q1-poorest	Private	19.85	58.22	8.99	232.44	319.50	5	6,027
	Public	10.10	32.75	29.99	27.58	100.42	1,257	1,481,592
Q2	Parochial	9.94	71.31	49.29	80.42	210.96	9	12,950
	Private	65.44	106.94	83.95	147.84	404.17	15	21,810
	Public	16.95	50.51	43.57	58.52	169.55	1,277	1,526,216
Q3	Parochial	91.51	83.07	63.98	216.48	455.04	16	22,767
	Private	83.70	125.25	72.93	430.61	712.49	36	51,158
	Public	27.98	73.94	52.39	116.03	270.33	1,141	1,375,965
Q4	Parochial	146.17	94.89	80.23	429.30	750.60	11	13,617
	Private	84.21	136.20	97.97	490.41	808.79	116	168,124
	Public	42.99	96.96	67.54	197.48	404.97	1,003	1,257,069
Q5-richest	Parochial	97.18	124.02	99.09	899.78	1,220.06	19	26,556
	Private	342.35	242.49	92.78	1,858.42	2,536.03	333	447,223
	Public	101.07	152.01	70.63	538.95	862.66	720	922,859
All	Parochial	89.38	97.51	76.67	470.56	734.12	55	75,890
	Private	249.29	202.26	91.57	1,354.14	1,897.25	505	694,342
	Public	34.53	74.58	50.75	157.76	317.61	5,398	6,563,702
Sum total	All types	55.43	86.90	54.88	274.26	471.47	5,958	7,333,934

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.8: Total Household Expenditures on Preprimary Education by School Type, 1997 (Soles)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Projected population
Q1-poorest	Private		8,348		8,294	16,642	807
	Public	997,511	6,153,643	5,409,215	3,711,363	16,271,732	260,964
Q2	Parochial	5,703	128,325	114,067	124,677	372,773	2,758
	Private	405,786	919,441	521,177	1,082,643	2,929,047	6,634
	Public	1,407,301	8,660,048	7,474,975	6,853,051	24,395,375	225,617
Q3	Parochial	40,028	92,385	276,861	447,494	856,768	2,193
	Private	1,224,929	1,586,396	1,049,215	3,941,048	7,801,589	12,893
	Public	2,154,922	10,675,767	7,952,087	9,821,412	30,604,186	170,802
Q4	Parochial	21,221	45,473	30,315	211,203	308,211	586
	Private	2,000,737	4,762,970	4,130,151	14,914,804	25,808,662	33,850
	Public	3,562,194	10,314,771	10,390,226	14,572,296	38,839,487	154,129
Q5-richest	Parochial	76,831	341,471	341,471	662,449	1,422,222	1,648
	Private	7,081,671	8,794,844	5,967,182	45,276,717	67,120,414	42,159
	Public	3,076,362	8,004,475	6,358,016	16,372,644	33,811,497	78,465
All	Parochial	143,783	607,654	762,714	1,445,823	2,959,974	7,185
	Private	10,713,123	16,071,999	11,667,725	65,223,506	103,676,353	96,343
	Public	11,198,290	43,808,704	37,584,518	51,330,766	143,922,278	889,977
Sum total	All types	22,055,196	60,488,357	50,014,957	118,000,095	250,558,606	993,505

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.9: Total Household Expenditures on Primary Education by School Type, 1997 (Soles)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Projected population
Q1-poorest	Private	34,249	136,997		372,594	543,841	1,648
	Public	7,370,675	27,478,868	25,341,437	18,982,755	79,173,734	895,101
Q2	Parochial	123,084	795,089	524,238	916,737	2,359,148	10,192
	Private	324,844	682,755	1,023,995	1,558,137	3,589,731	7,967
	Public	9,127,476	37,984,802	34,228,377	36,307,590	117,848,245	827,612
Q3	Parochial	443,694	730,664	807,805	1,569,155	3,551,319	9,795
	Private	2,094,285	3,399,769	2,241,203	13,343,133	21,078,390	25,835
	Public	9,375,199	45,494,475	39,403,364	48,558,205	142,831,242	685,956
Q4	Parochial	1,476,395	740,674	718,782	3,062,484	5,998,335	8,099
	Private	5,509,040	11,132,944	7,293,612	36,441,733	60,377,329	70,539
	Public	9,907,406	42,082,922	38,957,651	61,325,669	152,273,648	494,873
Q5-richest	Parochial	694,337	753,348	1,107,144	3,213,481	5,768,309	7,832
	Private	51,999,106	31,457,963	20,690,406	231,972,208	336,119,682	150,271
	Public	8,457,493	31,993,049	27,790,849	56,778,350	125,019,741	270,195
All	Parochial	2,737,509	3,019,776	3,157,968	8,761,857	17,677,111	35,917
	Private	59,961,524	46,810,427	31,249,216	283,687,805	421,708,973	256,259
	Public	44,238,249	185,034,115	165,721,678	222,152,567	617,146,609	3,173,737
Sum total	All types	106,937,283	234,864,318	200,128,862	514,602,230	1,056,532,693	3,465,914

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.10: Total Household Expenditures on Secondary Education by School Type, 1997 (Soles)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Projected population
Q1-poorest	Private	85,379	205,569	54,182	1,020,092	1,365,222	3,572
	Public	4,521,983	12,779,775	12,685,371	12,417,217	42,404,346	288,154
Q2	Private	486,542	643,867	285,755	583,499	1,999,663	5,811
	Public	9,402,559	24,279,302	23,656,967	30,334,272	87,673,100	409,393
Q3	Parochial	805,904	936,193	371,875	683,624	2,797,596	9,131
	Private	824,104	867,415	418,240	2,507,373	4,617,132	11,051
	Public	13,737,058	31,991,113	23,013,615	57,103,557	125,845,342	402,306
Q4	Parochial	492,777	505,974	343,337	2,572,013	3,914,101	4,932
	Private	4,248,888	5,406,171	4,709,510	18,345,807	32,710,375	48,807
	Public	19,202,940	45,183,285	31,616,994	98,276,186	194,279,404	437,669
Q5-richest	Parochial	483,176	802,660	1,147,119	7,593,171	10,026,126	8,387
	Private	40,840,419	27,640,164	13,569,061	175,804,912	257,854,556	111,946
	Public	32,737,386	44,241,702	24,821,093	144,876,628	246,676,808	318,495
All	Parochial	1,781,858	2,244,827	1,862,331	10,848,807	16,737,822	22,450
	Private	46,485,332	34,763,186	19,036,748	198,261,682	298,546,947	181,188
	Public	79,601,925	158,475,177	115,794,038	343,007,860	696,879,000	1,856,017
Sum total	**All types**	**127,869,114**	**195,483,190**	**136,693,116**	**552,118,349**	**1,012,163,770**	**2,059,656**

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.11: Total Household Expenditures on Tertiary Nonuniversity Education by School Type, 1997 (Soles)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Projected population
Q1-poorest							
	Public	872,611	981,466	778,410	2,569,300	5,201,787	21,213
Q2							
	Public	3,643,732	3,985,778	1,143,705	11,608,776	20,381,992	39,808
Q3	Private	138,530	554,120	22,165	2,237,640	2,952,455	1,379
	Public	4,021,026	3,072,962	983,040	17,525,048	25,602,077	43,187
Q4	Private	924,260	908,247	337,995	7,419,999	9,590,501	6,329
	Public	7,828,321	7,339,602	3,407,106	29,937,232	48,512,260	68,602
Q5-richest	Parochial	138,530	213,876	35,646	5,142,641	5,530,693	2,899
	Private	2,108,869	1,790,101	263,311	19,520,223	23,682,506	16,145
	Public	12,058,199	11,303,118	3,591,499	64,511,210	91,464,026	69,103
All	Parochial	138,530	213,876	35,646	5,142,641	5,530,693	2,899
	Private	3,171,659	3,252,468	623,471	29,177,863	36,225,461	23,853
	Public	28,423,889	26,682,927	9,903,760	126,151,567	191,162,142	241,914
Sum total	**All types**	**31,734,079**	**30,149,271**	**10,562,876**	**160,472,071**	**232,918,296**	**268,667**

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.12: Total Household Expenditures on University Education by School Type, 1997 (Soles)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Projected population
Q1-poorest	Public	1,195,621	1,127,691	220,347	3,183,795	5,727,454	16,159
Q2	Private	210,064	86,378			296,441	1,398
	Public	2,285,350	2,176,500		4,015,082	8,476,932	23,786
Q3	Private	793,692	132,056		2,228,440	3,154,187	1,648
	Public	9,206,850	10,498,187	730,743	26,650,176	47,085,956	73,714
Q4	Private	1,474,118	688,428		5,327,370	7,489,915	8,599
	Public	13,537,940	16,964,692	525,617	44,136,391	75,164,640	101,796
Q5-richest	Parochial	1,187,759	1,182,148		7,283,179	9,653,086	5,791
	Private	51,077,395	38,762,463	1,001,194	358,554,708	449,395,762	126,701
	Public	36,944,862	44,743,189	2,622,583	214,835,285	299,145,918	186,601
All	Parochial	1,981,451	1,314,203		9,511,619	12,807,273	7,439
	Private	52,761,577	39,537,269	1,001,194	363,882,079	457,182,118	136,698
	Public	63,170,622	75,510,259	4,099,290	292,820,730	435,600,901	402,055
Sum total	**All types**	**117,913,650**	**116,361,730**	**5,100,485**	**666,214,427**	**905,590,292**	**546,192**

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.13: Total Household Expenditures on Education by Education Level, 1997 (Soles)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Projected population
Q1-poorest	Preprimary	997,511	6,161,991	5,409,215	3,719,656	16,288,374	261,772
	Primary	7,404,925	27,615,865	25,341,437	19,355,348	79,717,575	896,749
	Secondary	4,607,362	12,985,344	12,739,553	13,437,309	43,769,568	291,726
	Sup. no univ.	872,611	981,466	778,410	2,569,300	5,201,787	21,213
	Sup. univ.	1,195,621	1,127,691	220,347	3,183,795	5,727,454	16,159
Q2	Preprimary	1,818,790	9,707,814	8,110,219	8,060,371	27,697,194	235,010
	Primary	9,575,404	39,462,646	35,776,610	38,982,464	123,797,123	845,770
	Secondary	9,889,101	24,923,169	23,942,721	30,917,771	89,672,762	415,204
	Sup. no univ.	3,643,732	3,985,778	1,143,705	11,608,776	20,381,992	39,808
	Sup. univ.	2,495,413	2,262,878	0	4,015,082	8,773,374	25,184
Q3	Preprimary	3,419,879	12,354,548	9,278,163	14,209,954	39,262,543	185,887
	Primary	11,913,177	49,624,908	42,452,372	63,470,493	167,460,950	721,586
	Secondary	15,367,066	33,794,721	23,803,730	60,294,553	133,260,070	422,488
	Sup. no univ.	4,159,556	3,627,082	1,005,205	19,762,689	28,554,531	44,566
	Sup. univ.	10,000,541	10,630,243	730,743	28,878,616	50,240,144	75,362
Q4	Preprimary	5,584,152	15,123,214	14,550,692	29,698,303	64,956,361	188,565
	Primary	16,892,841	53,956,540	46,970,045	100,829,886	218,649,312	573,511
	Secondary	23,944,604	51,095,430	36,669,840	119,194,005	230,903,880	491,409
	Sup. no univ.	8,752,581	8,247,849	3,745,100	37,357,231	58,102,761	74,931
	Sup. univ.	15,012,057	17,653,120	525,617	49,463,761	82,654,556	110,394
Q5-richest	Preprimary	10,234,864	17,140,789	12,666,669	62,311,811	102,354,133	122,272
	Primary	61,150,936	64,204,360	49,588,399	291,964,038	466,907,732	428,297
	Secondary	74,060,981	72,684,526	39,537,272	328,274,711	514,557,490	438,828
	Sup. no univ.	14,305,598	13,307,096	3,890,456	89,174,075	120,677,225	88,148
	Sup. univ.	89,210,017	84,687,800	3,623,777	580,673,172	758,194,765	319,093
All groups	Preprimary	22,055,196	60,488,357	50,014,957	118,000,095	250,558,606	993,505
	Primary	106,937,283	234,864,318	200,128,862	514,602,230	1,056,532,693	3,465,914
	Secondary	127,869,114	195,483,190	136,693,116	552,118,349	1,012,163,770	2,059,656
	Sup. no univ.	31,734,079	30,149,271	10,562,876	160,472,071	232,918,296	268,667
	Sup. univ.	117,913,650	116,361,730	5,100,485	666,214,427	905,590,292	546,192
Sum total	**All types**	**406,509,322**	**637,346,866**	**402,500,297**	**2,011,407,172**	**3,457,763,657**	**7,333,934**

Source: Household survey by Instituto Cuanto 1997.

Appendix 7.14: Total Household Expenditures on Education by School Type, 1997 (Soles)

Consumption quintile		Fees, APAFA	Books and supplies	School uniforms	Tuition, food, and transport	Total	Projected population
Q1-poorest	Private	119,628	350,914	54,182	1,400,980	1,925,704	6,027
	Public	14,958,401	48,521,443	44,434,780	40,864,430	148,779,053	1,481,592
Q2	Parochial	128,787	923,414	638,305	1,041,414	2,731,920	12,950
	Private	1,427,235	2,332,440	1,830,926	3,224,279	8,814,881	21,810
	Public	25,866,419	77,086,431	66,504,023	89,318,771	258,775,644	1,526,216
Q3	Parochial	2,083,318	1,891,298	1,456,541	4,928,713	10,359,870	22,767
	Private	4,281,848	6,407,700	3,730,824	22,029,194	36,449,565	51,158
	Public	38,495,054	101,732,503	72,082,849	159,658,398	371,968,804	1,375,965
Q4	Parochial	1,990,392	1,292,122	1,092,434	5,845,699	10,220,647	13,617
	Private	14,157,043	22,898,760	16,471,268	82,449,713	135,976,783	168,124
	Public	54,038,800	121,885,271	84,897,593	248,247,775	509,069,439	1,257,069
Q5-richest	Parochial	2,580,633	3,293,502	2,631,380	23,894,921	32,400,436	26,556
	Private	153,107,461	108,445,535	41,491,154	831,128,769	1,134,172,919	447,223
	Public	93,274,301	140,285,533	65,184,040	497,374,117	796,117,991	922,859
All	Parochial	6,783,131	7,400,336	5,818,659	35,710,747	55,712,873	75,890
	Private	173,093,215	140,435,350	63,578,354	940,232,935	1,317,339,853	694,342
	Public	226,632,976	489,511,181	333,103,284	1,035,463,490	2,084,710,931	6,563,702
Sum total	**All types**	**406,509,322**	**637,346,866**	**402,500,297**	**2,011,407,172**	**3,457,763,657**	**7,333,934**

Source: Household survey by Instituto Cuanto 1997.

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APPENDIX 8
POPULATION PROJECTION

Appendix 8.1. Assumptions of Population Projection

PERU	Projection (000s) with NRR=1 by 2010					
Age Group	1995	2000	2005	2010	2015	2020
Birth rate		24.9	22.1	19.4	18.2	17.7
Death rate		6.3	6.3	6.1	5.8	6
Rate of nat. inc.		1.86	1.58	1.33	1.25	1.17
Net migration rate		-0.8	-0.4	-0.2	-0.1	0
Growth rate		1.78	1.55	1.31	1.24	1.17
Total fertility		3	2.6	2.25	2.12	2.11
NRR		1.37	1.2	1.05	1	1
e(0)-Both sexes		68.5	69	70.3	72.2	73
e(15) - Both sexes		57.6	57.4	58.1	59.5	60
IMR-Both sexes		40	34	28	22.2	20.3
q(5)-Both sexes		0.05	0.04	0.03	0.03	0.02
DEP. RAT	67.4	61.5	55.9	50.7	47	45

Appendix 8.2.Population by Single Years of Age for Selected Age Ranges and Years, 1995-2020 (Units=1000's)

Age Group	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Males																										
5	296	296	296	296	296	293	297	298	299	299	301	300	296	292	288	284	287	282	278	273	269	275	278	280	283	285
5	296	296	296	296	296	293	297	298	299	299	301	300	296	292	288	284	287	282	278	273	269	275	278	280	283	285
6	294	295	296	296	296	295	293	297	298	298	299	300	300	296	292	288	284	286	282	277	273	269	275	277	280	283
7	292	293	295	295	296	295	295	293	297	297	298	299	300	300	296	291	287	284	286	282	277	273	269	275	277	280
8	289	291	293	294	295	295	295	295	292	296	297	298	299	300	299	295	291	287	283	286	282	277	273	268	275	277
9	286	289	291	292	294	295	295	295	294	292	296	297	298	298	300	299	295	291	287	283	286	281	277	272	268	274
10	284	286	288	290	292	293	294	295	294	294	292	296	297	297	298	299	299	295	291	287	283	286	281	277	272	268
11	281	283	286	288	290	292	293	294	294	294	294	291	296	296	297	298	299	299	295	291	287	283	286	281	277	272
6-11	**1726**	**1737**	**1749**	**1755**	**1763**	**1765**	**1765**	**1769**	**1769**	**1771**	**1776**	**1781**	**1790**	**1787**	**1782**	**1770**	**1755**	**1742**	**1724**	**1706**	**1688**	**1669**	**1661**	**1650**	**1649**	**1654**
12	278	280	283	285	288	290	291	293	294	294	294	294	291	295	296	297	298	299	299	295	291	287	283	285	281	276
13	276	278	280	282	285	287	289	291	292	293	294	294	293	291	295	296	297	298	299	299	295	290	286	283	285	281
14	274	276	278	280	282	285	287	289	291	292	293	294	294	293	291	295	296	297	297	299	299	294	290	286	283	285
15	272	274	275	277	279	282	285	287	289	290	292	293	293	293	293	290	295	296	296	297	298	298	294	290	286	282
12-15	**1100**	**1108**	**1116**	**1124**	**1134**	**1144**	**1152**	**1160**	**1166**	**1169**	**1173**	**1175**	**1171**	**1172**	**1175**	**1178**	**1186**	**1190**	**1191**	**1190**	**1183**	**1169**	**1153**	**1144**	**1135**	**1124**
16	269	272	273	275	277	279	281	284	286	288	290	292	293	293	293	293	290	295	295	296	297	298	298	294	290	286
17	265	269	271	273	274	276	278	281	284	286	288	290	291	292	293	293	292	290	294	295	296	297	298	298	294	290
16-17	**534**	**541**	**544**	**548**	**551**	**555**	**559**	**565**	**570**	**574**	**578**	**582**	**584**	**585**	**586**	**586**	**582**	**585**	**589**	**591**	**593**	**595**	**596**	**592**	**584**	**576**
18	260	264	268	271	272	274	276	278	281	283	285	288	289	291	292	292	292	292	290	294	295	296	296	298	298	293
19	253	259	264	268	270	271	273	275	277	280	283	285	287	289	290	291	292	292	292	289	293	294	295	296	297	297
20	245	252	258	263	267	269	271	273	275	277	279	282	284	287	288	290	291	291	292	291	289	293	294	295	296	297
18-20	**758**	**775**	**790**	**802**	**809**	**814**	**820**	**826**	**833**	**840**	**847**	**855**	**860**	**867**	**870**	**873**	**875**	**875**	**874**	**874**	**877**	**883**	**885**	**889**	**891**	**887**
Total males	**11833**	**12057**	**12279**	**12500**	**12720**	**12938**	**13159**	**13375**	**13584**	**13786**	**13982**	**14186**	**14383**	**14573**	**14756**	**14932**	**15123**	**15314**	**15504**	**15695**	**15886**	**16077**	**16269**	**16459**	**16649**	**16838**

Appendix 8.2. (continued)

Age Group	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Females																										
5	287	287	287	287	286	284	287	288	288	289	290	289	285	281	277	274	276	271	267	263	259	264	267	269	272	274
5	287	287	287	287	286	284	287	288	288	289	290	289	285	281	277	274	276	271	267	263	259	264	267	269	272	274
6	285	286	287	287	286	286	283	287	287	288	289	290	289	285	281	277	273	276	271	267	263	258	264	267	269	272
7	283	285	286	286	286	286	285	283	286	287	288	288	290	289	285	281	277	273	276	271	267	262	258	264	267	269
8	281	283	284	285	286	286	286	285	283	286	287	288	288	289	289	285	281	277	273	275	271	267	262	258	264	266
9	278	281	282	284	285	286	286	285	285	283	286	287	287	288	289	289	285	281	277	273	275	271	267	262	258	264
10	276	278	280	282	284	285	285	286	285	285	282	286	287	287	288	289	289	285	281	277	273	275	271	267	262	258
11	273	275	278	280	282	283	284	285	285	285	284	282	286	286	287	288	289	289	285	281	277	273	275	271	266	262
6-11	1676	1688	1697	1704	1709	1712	1709	1711	1711	1714	1716	1721	1727	1724	1719	1709	1694	1681	1663	1644	1626	1606	1597	1589	1586	1591
12	271	273	275	277	280	282	283	284	285	285	285	284	282	286	286	287	288	289	288	284	281	277	273	275	271	266
13	269	270	272	275	277	279	281	283	284	285	285	285	284	282	285	286	287	288	289	288	284	280	276	273	275	271
14	267	269	270	272	274	277	279	281	283	284	285	285	285	284	282	285	286	287	288	289	288	284	280	276	273	275
15	266	267	268	270	272	274	277	279	281	282	284	285	285	284	284	282	285	286	287	287	289	288	284	280	276	273
12-15	1073	1079	1085	1094	1103	1112	1120	1127	1133	1136	1139	1139	1136	1136	1137	1140	1146	1150	1152	1148	1142	1129	1113	1104	1095	1085
16	263	265	267	268	269	271	274	277	279	281	282	283	284	285	284	284	282	285	286	287	287	288	288	284	280	276
17	260	263	265	266	267	269	271	274	276	278	280	282	283	284	284	284	284	281	285	286	286	287	288	288	284	280
16-17	523	528	532	534	536	540	545	551	555	559	562	565	567	569	568	568	566	566	571	573	573	575	576	572	564	556
18	255	260	263	265	266	267	269	271	273	276	278	280	282	283	284	284	284	283	281	285	285	286	287	288	288	284
19	250	255	259	262	264	265	267	268	270	273	275	278	280	281	283	284	284	284	283	281	285	285	286	287	288	288
20	243	249	254	259	262	264	265	266	268	270	272	275	278	280	281	282	283	284	284	283	281	284	285	286	287	288
18-20	748	764	776	786	792	796	801	805	811	819	825	833	840	844	848	850	851	851	848	849	851	855	858	861	863	860
Total females	11986	12210	12432	12653	12873	13092	13328	13549	13757	13953	14139	14360	14565	14756	14933	15099	15310	15511	15702	15887	16066	16281	16484	16675	16858	17033
TOTAL M+F	23819	24266	24711	25154	25593	26030	26487	26923	27340	27739	28121	28546	28948	29329	29690	30032	30433	30824	31207	31582	31952	32359	32752	33135	33507	33871

Source: World Bank Projection.

Appendix 8.3: Projected School-Age Population, 1995-2020 (Units=1000's)

Age Group	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Males																										
5	296	296	296	296	296	293	297	298	299	299	301	300	296	292	288	284	287	282	278	273	269	275	278	280	283	285
6-11	1726	1737	1749	1755	1763	1765	1765	1769	1769	1771	1776	1781	1790	1787	1782	1770	1755	1742	1724	1706	1688	1669	1661	1650	1649	1654
12-15	1100	1108	1116	1124	1134	1144	1152	1160	1166	1169	1173	1175	1171	1172	1175	1178	1186	1190	1191	1190	1183	1169	1153	1144	1135	1124
16-17	534	541	544	548	551	555	559	565	570	574	578	582	584	585	586	586	582	585	589	591	593	595	596	592	584	576
18-20	758	775	790	802	809	814	820	826	833	840	847	855	860	867	870	873	875	875	874	874	877	883	885	889	891	887
Females																										
5	287	287	287	287	286	284	287	288	288	289	290	289	285	281	277	274	276	271	267	263	259	264	267	269	272	274
6-11	1676	1688	1697	1704	1709	1712	1709	1711	1711	1714	1716	1721	1727	1724	1719	1709	1694	1681	1663	1644	1626	1606	1597	1589	1586	1591
12-15	1073	1079	1085	1094	1103	1112	1120	1127	1133	1136	1139	1139	1136	1136	1137	1140	1146	1150	1152	1148	1142	1129	1113	1104	1095	1085
16-17	523	528	532	534	536	540	545	551	555	559	562	565	567	569	568	568	566	566	571	573	573	575	576	572	564	556
18-20	748	764	776	786	792	796	801	805	811	819	825	833	840	844	848	850	851	851	848	849	851	855	858	861	863	860
M+F																										
5	583	583	583	583	582	577	584	586	587	588	591	589	581	573	565	558	563	553	545	536	528	539	545	549	555	559
6-11	3402	3425	3446	3459	3472	3477	3474	3480	3480	3485	3492	3502	3517	3511	3501	3479	3449	3423	3387	3350	3314	3275	3258	3239	3235	3245
12-15	2173	2187	2201	2218	2237	2256	2272	2287	2299	2305	2312	2314	2307	2308	2312	2318	2332	2340	2343	2338	2325	2298	2266	2248	2230	2209
16-17	1057	1069	1076	1082	1087	1095	1104	1116	1125	1133	1140	1147	1151	1154	1154	1154	1148	1151	1160	1164	1166	1170	1172	1164	1148	1132
18-20	1506	1539	1566	1588	1601	1610	1621	1631	1644	1659	1672	1688	1700	1711	1718	1723	1726	1726	1722	1723	1728	1738	1743	1750	1754	1747

Source: World Bank Projection.

APPENDIX 9

EXTERNAL SUPPORT FOR EDUCATION SINCE 1990

Appendix 9: External Support for Education since 1990

Organization	Loan or grant amount (US$)	Implementation dates	Implementation agency	Description of the project	Problems/solutions
World Bank	146,400,000	1995-2000	Ministry of Education	**Basic Education Quality Project.** The objective of the Project is to assist the MOE to improve the quality of its public primary education, to improve student achievement, and to reduce the incidence of repetition and dropout. It has the following components: (1) Education Quality Improvement, including (a) curricular reform, (b) provision of textbooks and didactic materials, and (c) in-service teacher training; (2) Modernization of Educational Administration including (a) a program to improve the management by MOE of the educational system, (b) the Pilot Plan for Modernization of School Management, (c) program for decentralization of the sector, (d) the establishment of an MIS, (e) the development of a student assessment system; and (3) Infrastructure Improvement through (a) the construction and rehabilitation of schools, (b) the provision of furniture for these schools, and (c) the development of a maintenance program.	Main problem identified is the slow implementation rate of the infrastructure component.
Inter-American Development Bank	500,000	9/96-12/97	Ministry of Education	**Education Sector Reform Project (PPF).** Preparation facility for Project below	
Inter-American Development Bank	100,000,000	12/96-12/2001	Ministry of Education	**Special Program for the Improvement of Education Quality.** Project components are: (1) Institutional strengthening of the Ministry of Education, including Teacher Performance Improvement System, Education Quality Measurement System, strategic planning, strengthening of teacher pre-service training schools, management training, and preschools; (2) strengthening of the 5-year-old program, including curriculum development, educational material, in-service teacher training, and infrastructure; (3) strengthening of secondary education, including curriculum development, educational materials, in-service teacher training, and quality networks; (4) education for work, including modernization of the public offer and curriculum development.	Main problem identified is slow implementation rate. Proposed solution is to strengthen Project Coordination Unit and hire consultants to provide support to activities being carried out within the Ministry.

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Appendix 9: (continued)					
UNFPA	246,500	6/96-12/97	Ministry of Education	**Support to Communication Activities on Population at the National Level.** Review and publication of the Sex Education Guidelines for teachers and parents	Slow progress in teacher training and in distribution of the Guidelines.
UNFPA	144,728	12/95-6/97	Asociación de Trabajo Laico Familiar (ATLF)	**Education on Responsible Parenthood and Information on Natural Methods for Family Planning for Adolescents in Lima and Callao.** The objective of the Project was to contribute to the National Education Program on Population by promoting and stimulating awareness on population dynamics. The goal was to improve knowledge and abilities in 1,500 teachers and 5,000 parents to provide counsel to adolescents on planned parenthood and sexual education.	Main problem identified was the lack of sustainability of the recipient institution since it is completely dependent on external funds.
UNFPA	215,657	10/96- ongoing	Centro de Estudios Para el Desarrollo Regional (CEDER) and Regional Council for Population from Arequipa	**Sex Education of Adolescents in the Arequipa Region.** The objectives of the project are to contribute substantially to the sexual education in Arequipa from a gender perspective through research, socialization, and initiation of a training model for teachers and health professionals. The aim is to generate change in 1,082 teachers and 26,000 students from 973 schools, and in 20 health professionals and 800 adolescents not attending schools from rural and urban areas.	Main problem identified is to attract and keep interested those adolescents who are not part of the school system.
UNFPA	222,230	11/97- ongoing	Ministry of Education	**Preparation for the Project providing support to the National Program on Sex Education.** The objective of the Project is to contribute to the National Population Program 1996-2000, through the generalized training on Sex Education for secondary school students and the development of the Family and Sex Education Guidelines.	The Guidelines should be drafted to respond to the conditions of the various regions of the country.
GTZ	1,984,802	3/1996-6/1998	Ministry of Education	**Preparation for the Reform of the Teacher Training Program.** The objectives of the Project were: to develop a new concept and strategy for primary education teacher presence training and to integrate bilingual intercultural education and gender issues in the primary education reform.	The main problem identified was the difficulty in communication and coordination between the various actors.

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Appendix 9: (continued)					
European Commission	5,000,000	12/97- 12/98	Ministry of Education	**Support to the Basic Social Expenditure "Educación Básica para Todos."** The project finances the production, procurement and distribution of educational material in Spanish for third and fourth grades and bilingual materials for first and second grade to be used in single and multi-grade schools located in the rural sierra and jungle. It also provides teacher training for the use of these materials. The Project also finances a team of consultants in the definition of guidelines and strategies to improve the quality of rural education.	There are coordination difficulties at the technical and financial levels. There is overlap in the various programs under execution in the Ministry.
European Commission	8,082,622	6/96 – 12/01	Ministry of Education	**Development and Insertion of Youth in Peru.** The Projects is targeted to a population group between the ages of 15 and 24 who abandoned the education system without completing a professional education. It is based on the network of the Public Higher Education Institutes in La Libertad and Cajamarca and includes the following activities: Professional training, available training resources, management of resource and centers, technology transfer, business orientation, pedagogical innovations.	There is adequate coordination for this program at the central and regional level. There are problems with counterpart funds and administrative delays. The sustainability of this process depends on a flexible and agile training program linked to the productive environment.
European Commission	8,082,622	1/98-1/03	Ministry of Education	**Professional Technical and Pedagogical Training Program.** This program is divided into two parts: The Horizontal Project for Teacher Training in Technical Education has as its main objective the improvement of the quality of the technical and professional training system. This Project has national coverage and will be executed through 13 Magnet Schools. It will target to 10,650 teachers of technical subjects. The second part is the Teacher Training Program in Bilingual Intercultural Education in the Amazon Basin and has as its main objective the integration of indigenous communities in the jungle through teacher training, applied research, and development of curricular and didactic materials. This Project will benefit 1,000 teachers and 100 teacher trainers.	There is good and fluid coordination.

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Appendix 9: (continued)					
European Commission	810,000	11/95 – 12/97	Ministry of Education	**Pedagogical and Technological Training and Research in Education-Related Disciplines.** The Project objective is to contribute to the improvement of technical education through training on science and technology of teachers from Technical Schools. The Project created Training Networks in eight cities in Peru.	The Project concluded successfully.
USAID	2,974,668	9/92 – 9/96	Partner for the Americas	**Peruvian Program of Scholarships for Peace.** The program provided leaders and potential leaders with specific abilities, training, and academic education, as well as understanding about the operation of the democratic process in a country with a free market economy.	
USAID	664,000	9/96 – 9/99	UNICEF	**Transit to Primary Education**. Support to the MOE in its efforts to improve the quality of public education.	Substantial improvement is needed in the quality of education in the first and second grades to be evaluated through entry and exit tests.
USAID	362,000*	8/95 – 12/99	CARE	**Strengthening of Health Institutions.** The southern component of this Project includes a subcomponent that provides financing for basic education activities in the "Aymara" population in Puno.	
USAID	2,300,000	1/98 – 1/2	CARE	**Girls Education.** The project aims toward the development of guidelines to identify barriers and long term solutions with respect to the education of girls and committing leaders from public and private sector organizations to promote policies and programs that will improve the opportunities and quality of education for girls.	

Appendix 9: (continued)					
DIACONIA Lutheran Evangelical Association for Assistance to Community Development	644,000	97-01	Ministry of Education	**Schools Agricultural Production Unit.** The Project aims to improve the living conditions of the rural child and his/her family through the improvement of diet and health by promoting the harvest and consumption of vegetables produced with agroecological techniques. It also contributes to the improvement of Primary Education through the development of a curriculum for rural areas.	High levels of malnutrition. Education in rural schools is geared towards memorization and not oriented to the learning process. High rotation rate of teachers trained by the Project. Lack of identification of teachers with the community. Lack of training materials.
UNESCO/ DANIDA	311,400	6/96 – 6/00	Ministry for the Promotion of Women and Human Development (PROMUDEH)	**Alphabetization and Civic Education of Indigenous and Displaced Women in Peru.** The objective is to promote the use of civic, cultural, and gender rights of indigenous and displaced women to overcome analphabetism and exclusion.	Project had problems due to change in implementation institution (from MOE to PROMUDEH).
UNESCO/ DANIDA	553,700	1/96 – 12/98	Ministry of Education	**Integration of Handicapped Children in Regular Schools.** The objective is to consolidate school integration through teacher training, specialized support to teachers, socialization activities, teacher supervision, and distribution of educational materials	Lack of an institutional framework in the process.
Save the Children	172,635	3/93 – 7/96	EDUCA – Institute for the Quality of Education / Arariwa	**Health and Development Education in Schools of the INKA Region.** The objective of the project was to promote the development and application of child integrated attention in 40 schools in the Inka Region. The project benefited 1,600 children and 60 teachers.	Difficulty in integration of project activities within the school.
Save the Children /European Union/ ADAR	67,388*	4/97 – 3/99	Asociación para el Desarrollo Amazónico Rural (ADAR)	**Community Development in Native and Mixed Communities of the Peruvian Amazon Basin.** The objective of the project is to train and provide assistance to community leaders and workers to manage a rural development model based on primary health, basic sanitation, and nutritional assessment. The Project includes a component of health education developed within the school setting.	Implementation of this type of project requires a strong monitoring and evaluation system

Appendix 9: (continued)					
Spanish Agency for International Cooperation (AECI)	817,458	93-98	Ministry of Education	**Design of the Technical Education and Professional Training System.** The Project is developing a national certification system for teachers and technical education, the curriculum for a selection of professions, and the Program for teacher training within the professional training system.	
Spanish Agency for International Cooperation (AECI)	880,525	92-98	Ministry of Education	**Quality of Education and Regional Development.** The Project aims to improve teacher training, certification and quality in the Teacher Training Institutes. The Project contributes to the development of the second specialization in teacher training. Activities are developed through distance education to facilitate teacher participation.	
Spanish Agency for International Cooperation (AECI)	1,331,267	92-98	Instituto Superior Pedagógico Loreto and AIDE-SEP	**Bilingual Teacher Training in the Peruvian Amazon Basin.** The project has developed a bilingual intercultural teacher training curriculum, and trains teachers from various indigenous nations on bilingual intercultural education is to contribute to the development.	
Spanish Agency for International Cooperation (AECI)	500,000	97-98	Ministry of Industry, Ministry of Education, PROMPEX and Leather and Shoe Associations	**Assistance to the "Instituto Superior Tecnológico del Calzado."** The Project provides support to development and activities of the above institution.	
Spanish Agency for International Cooperation (AECI)	382,406	94-98	Asambiea Nacional de Rectores, Foreign Relations Ministry	**University Cooperation Program.** The Program finances the exchange of professors, managers, and students between Latin America and Spain. To date it has benefited 678 students and 340 professors.	
Spanish Agency for International Cooperation (AECI)	1,600,000	96-98	Ministry of Foreign Relations, Ministry of Education, INABEC, CONCYTEC, Ministry of the Presidency	**Program for Training of Human Resources.** The Program provides study grants for Peruvian professionals to travel to Spain. To date it has benefited 102 people.	

* Amount reflects the education component of the larger project.

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Appendix 9: (continued)					
Organization	**Loan or grant amount (US$)**	**Implementation dates**	**Implementation agency**	**Description of the Project**	**Problems/ solutions**
UNICEF	11,430,600	1992-1998	Ministry of Education	**Basic Education.** The objective of the Project is to contribute to national efforts to reduce educational exclusion and to compensate for inequities in the use of basic education rights. Specifically the Project aims to (a) strengthen the educational management at the local and subregional levels in 10 departments through joint management initiatives and improving social control of results in schools; (b) improve by 30 percent the student learning performance in communication, interpretation, and production of texts and problem resolution; and (c) implement the proposed increase of 20 percent of effective learning time through the development of complementary learning spaces. The project includes technical assistance, advocacy activities, provides support to local organizations, and provides schools with basic educational materials.	

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APPENDIX 10

SELECTED INDICATORS FOR INTERNATIONAL COMPARISON

Appendix 10.1: Educational Expenditure as a Percentage of GDP for All Levels of Education Combined, by Source of Funds (1997)

	Direct public expenditure for educational institutions	Public subsidies to households and other private entities excluding public subsidies for student living costs	Private payments to educational institutions excluding public subsidies to households and other private entities	Total expenditure from both public and private sources for educational institutions	Total expenditure from public, private and international sources for educational insitutions **plus** public subsidies to households	Private payments other than to educational institutions	Financial aid to students **not** attributable to household payments to educational institutions for educational services
Country mean	**5.1**	**0.09**	**0.76**	**5.8**	**6.1**	**0.4**	**0.31**
OECD total	**4.8**	**0.10**	**1.23**	**6.1**	**6.5**	**0.3**	**0.21**
IBRD members in OECD							
Korea	4.4	..	2.94	7.4	7.4	..	..
Mexico	4.5	..	0.95	5.5	5.6	0.3	0.11
Turkey	..	..	..	..	..	..	..
Non-OECD countries							
Argentina	3.7	..	0.71	4.4	4.4	..	..
Brazil[1]	4.8	..	..	..	..	..	..
Chile	3.2	0.12	2.52	5.9	5.9	..	0.03
Israel[2]	7.5	0.12	1.74	9.4	9.4	0.6	..
Malaysia	4.4	..	0.32	4.7	4.7	0.1	..
Paraguay	3.7	..	..	..	..	..	..
Philippines	3.0	0.02	1.42	4.4	4.5	1.6	..
Thailand	4.5	..	..	..	..	..	..
Uruguay	2.6	..	..	..	..	..	..
Zimbabwe	6.5	..	..	6.5	6.8	..	0.29

Source: OECD, 2000. *Education at a Glance*, Table B1.1a.

1. 1996 data.

2. 1995 data.

Appendix 10.2: Educational Expenditure as a Percentage of GDP for Primary, Secondary, and Postsecondary Nontertiary Education, by Source of Funds (1997)

	Direct public expenditure for educational institutions	Public subsidies to households and other private entities excluding public subsidies for student living costs	Private payments to educational institutions excluding public subsidies to households and other private entities	Total expenditure from both public and private sources for educational institutions	Total expenditure from public, private and international sources for educational institutions plus public subsidies to households	Private payments other than to educational institutions	Financial aid to students not attributable to household payments to educational institutions for educational services
Country mean	**3.6**	**0.02**	**0.36**	**3.9**	**4.0**	**0.2**	**0.16**
OECD total	**3.4**	**0.02**	**0.38**	**3.7**	**3.8**	**0.1**	**0.10**
IBRD members in OECD							
Korea	3.4	--	0.88	4.3	4.3	--	--
Mexico	3.3	--	0.62	3.9	4.0	0.2	0.04
Turkey	--	--	--	--	--	--	--
Non-OECD countries							
Argentina	2.7	--	0.26	3.0	3.0	--	--
Brazil[2]	3.5	--	--	--	--	--	--
Chile	2.5	--	1.15	3.7	3.7	--	0.01
India[1]	1.9	--	0.09	2.0	2.0	--	--
Israel[1,3]	5.1	0.05	0.33	5.4	5.4	0.3	--
Jordan[1]	4.7	--	--	--	--	--	--
Malaysia	3.0	--	--	3.0	3.0	--	0.01
Paraguay	3.0	--	--	--	--	--	--
Philippines	2.4	0.02	0.49	2.9	2.9	1.2	--
Thailand[1]	2.4	--	--	--	--	--	--
Uruguay	1.8	--	--	--	--	--	--
Zimbabwe	5.0	--	--	5.0	5.1	--	0.11

Source: OECD, 2000. *Education at a Glance*, Table B1.1b.
1. Excluding postsecondary nontertiary.
2. 1996 data.
3. 1995 data.

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Appendix 10.3: Educational Expenditure as a Percentage of GDP for Tertiary Education, by Source of Funds (1997)

	Direct public expenditure for educational institutions	Public subsidies to households and other private entities excluding public subsidies for student living costs	Private payments to educational institutions excluding public subsidies to households and other private entities	Total expenditure from both public and private sources for educational institutions	Total expenditure from public, private and international sources for educational institutions plus public subsidies to households	Private payments other than to educational institutions	Financial aid to students not attributable to household payments to educational institutions for educational services
Country mean	**1.0**	**0.06**	**0.31**	**1.3**	**1.5**	**0.2**	**0.23**
OECD total	**1.0**	**0.08**	**0.70**	**1.7**	**2.0**	**0.1**	**0.14**
IBRDmembers in OECD							
Korea	0.5	--	1.95	2.5	2.5	--	--
Mexico	0.8	--	0.27	1.1	1.2	--	0.07
Turkey	0.8	--	--	--	--	--	--
Non-OECD countries							
Argentina	0.8	--	0.29	1.0	1.1	--	--
Brazil[2]	0.8	--	--	--	--	--	--
Chile	0.4	0.12	1.25	1.8	1.8	--	0.02
Israel[3]	1.2	0.05	0.78	2.0	2.0	--	--
Malaysia	1.1	--	0.28	1.4	1.6	--	0.27
Paraguay	0.7	--	--	--	--	--	--
Philippines	0.5	0.01	0.94	1.4	1.4	0.4	--
Thailand	1.0	--	--	--	--	--	--
Uruguay	0.6	--	--	--	--	--	--
Zimbabwe	1.5	--	--	1.5	1.7	--	0.19

Source: OECD, 2000. *Education at a Glance*, Table B1.1c.

1. Includes postsecondary nontertiary data.
2. 1996 data.
3. 1995 data.

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Appendix 10.4: Educational Expenditure from Public and Private Sources for Educational Institutions as a Percentage of GDP by Level of Education (1997)

		Primary and secondary education				Tertiary education			All levels of education (including research)
	Pre-primary education	All	Primary & lower secondary	Upper secondary	Postsecondary nontertiary	All	Tertiary-type B (ISCED 5B)	Tertiary-type A (ISCED 5A & 6)	
Country mean	**0.4**	**3.9**	**2.5**	**1.3**	**0.1**	**1.3**	**0.2**	**1.1**	**5.8**
OECD total	**0.4**	**3.9**	**2.4**	**1.2**	**0.1**	**1.7**	**0.2**	**1.0**	**6.1**
IBRD members of OECD									
Korea	0.1	4.3	3.0	1.3	a	2.5	0.7	1.8	7.4
Mexico	0.5	3.9	3.0	0.9	a	1.1	x	1.1	5.5
Turkey	m	m	m	m	a	m	m	m	m
Non-OECD countries									
Argentina	0.4	3.0	2.4	0.6	a	1.0	0.4	0.7	4.4
Chile	0.4	3.7	2.6	1.0	a	1.8	0.2	1.6	5.9
Israel[2]	0.9	5.4	2.8	2.6	x	2.0	x	x	9.4
Malaysia	0.1	3.0	x	x	n	1.4	0.4	0.9	4.7
Philippines	m	2.9	2.6	0.2	0.1	1.4	a	0.5	4.4
Zimbabwe	x	5.0	5.0	x	x	1.5	0.6	0.8	6.5

Source: OECD, 2000. *Education at a Glance*, Table B1.1d.

1. Postsecondary nontertiary data included in tertiary education.

2. 1995 data.

Appendix 10.5: Educational Expenditure by Resource Category for Public and Private Institutions, by Level of Education (1997)

	Primary, secondary, and postsecondary nontertiary education						Tertiary education					
	Percentage of total expenditure		Percentage of current expenditure				Percentage of total expenditure		Percentage of current expenditure			
	Current	Capital	Compensation of teachers	Compensation of other staff	Compensation of all staff	Other current expenditure	Current	Capital	Compensation of teachers	Compensation of other staff	Compensation of all staff	Other current expenditure
Country mean	**91**	**9**	**64**	**14**	**80**	**20**	**87**	**13**	**42**	**23**	**67**	**33**
IBRD members in OECD												
Korea	86	14	x	x	83	17	69	31	38	15	53	47
Mexico[1]	93	7	77	12	89	11	89	11	66	18	84	16
Turkey[1,3]	87	13	--	--	91	9	73	27	--	--	67	33
Non-OECD countries												
Argentina[1,3]	92	8	52	44	96	4	88	12	49	32	81	19
Brazil[1,4]	93	7	82	x	82	18	94	6	78	x	78	22
Chile[1,3]	94	6	x	x	67	33	--	--	x	x	89	11
India[2,3]	97	3	83	8	91	9						
Israel[3,5]	89	11	x	x	77	23	90	10	x	x	76	24
Jordan[1,3]	86	14	88	8	96	4						
Malaysia[1]	89	11	68	16	84	16	66	34	x	x	x	x
Paraguay[1,3]	93	7	77	18	95	5	86	14	9	3	12	88
Philippines[1]	86	14	x	x	83	17	86	14	x	x	74	26
Uruguay[1,3]	94	6	74	14	88	12	94	6	59	20	79	21

Source: OECD, 2000. *Education at a Glance*, Table B5.1.

1 Public institutions.
2 Public and government-dependent private institutions.
3 Excludes postsecondary nontertiary education.
4 1996 data.
5 1995 data.
6 Postsecondary nontertiary education included at the tertiary level.

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Appendix 10.6: Expenditure per Student (US Dollars Converted using PPPs) on Public and Private Institutions by Level of Education (Based on Fulltime Equivalents) (1997)

	Early childhood	Primary	Lower secondary	Upper secondary	All secondary	Postsecondary nontertiary	Tertiary		
							All	Tertiary-type B	Tertiary-type A & Advanced research programmes
Country mean	**3463**	**3851**	**4791**	**5790**	**5274**	**5337**	**8612**	**7295**	**8434**
OECD total	**3788**	**3769**	**4175**	**5312**	**5507**	**7084**	**10892**	**6765**	**8252**
IBRD members of OECD									
Korea	1676	3308	3374	3652	3518	--	6844	4346	8512
Mexico	979	935	1443	2320	1726	--	4519	--	4519
Turkey[1]	--	--	--	--	--	--	2397	--	--
Non-OECD countries									
Argentina[1]	1054	1224	1467	1781	1575	--	11552	3494	--
Brazil[1,3]	820	859	921	1087	1002	--	10791	--	10791
Chile	1929	2115	2220	2337	2292	--	8775	4616	9820
India[1]	28	160	225	334	253	--	--	--	--
Jordan[1]	528	706	659	1176	807	--	--	--	--
Malaysia[1]	332	820	--	--	1334	6285	7793	6237	9129
Paraguay[1]	--	482	--	--	690	--	19271	19271	--
Philippines[1]	74	373	570	570	570	3189	2170	--	2170
Uruguay[1]	1104	974	979	1536	1221	--	2394	4062	2096
Zimbabwe	--	353	--	--	647	--	--	--	--

Source: OECD, 2000. *Education at a Glance*, Table B4.1.

1. Public institutions.
2. Public and government-dependent private institutions.
3. 1996 data.

Appendix 10.7: Expenditure per Student Relative to GDP per Capita on Public and Private Institutions by Level of Education (1997)

	Early childhood	Primary	Lower secondary	Upper secondary	All secondary	Postsecondary nontertiary	Tertiary		
							All	Tertiary-type B	Tertiary-type A & Advanced research programmes
Country mean	**17**	**19**	**24**	**30**	**26**	**19**	**45**	**35**	**48**
OECD total	**17**	**18**	**23**	**29**	**25**	**33**	**49**	**34**	**47**
IBRD members of OECD									
Korea	12	23	23	25	24	..	47	30	59
Mexico	13	12	19	30	22	..	59	..	59
Turkey[1]	..	..	..	..	..	..	37	..	..
Non-OECD countries									
Argentina[1]	10	12	14	17	15	..	112	34	..
Brazil[1,3]	13	13	14	17	16	..	167	..	167
Chile	15	17	17	18	18	..	69	36	77
India[1]	2	10	14	20	15	..	..	..	..
Jordan[1]	15	21	19	34	23	..	..	..	..
Malaysia[1]	4	10	..	..	16	77	96	77	112
Paraguay[1]	..	12	..	..	17	..	484	484	..
Philippines[1]	2	11	16	16	16	91	62	0	62
Uruguay[1]	12	11	11	17	13	..	26	44	23
Zimbabwe	..	15	..	..	28	..	..	..	..

Source: OECD, 2000. *Education at a Glance*. Table B4.2.

1. Public institutions.
2. Public and government-dependent private institutions.
3. 1996 data.

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